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Trapeziid crabs (Brachyura : Xanthoidea : Trapeziidae) of New Caledonia, eastern Australia, and the Coral Sea

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ABSTRACT

An examination of extensive collections made in New Caledonia and nearby islands by the ORSTOM Center in Nouméa, New Caledonia, of collections kept at various museums, and collections of live material made by the author in New Caledonia and in Queensland, Australia, has revealed that a total of 20 species belonging to five genera of trapeziid crabs inhabit the Coral Sea region. Two of the species belonging to the genus *Trapezia* are described as new. The taxonomic status of several species, particularly *Trapezia cymodoce* (Herbst, 1801), is also revised.

RÉSUMÉ

Crabes Trapeziidae (Brachyura : Xanthoidea : Trapeziidae) de Nouvelle-Calédonie, de la côte est d'Australie et de la mer du Corail.

L'étude des récoltes intensives faites en Nouvelle-Calédonie et dans les îles voisines par le centre ORSTOM de Nouméa, du matériel se trouvant dans les collections des divers musées, ainsi que des collections de matériel vivant faites par l'auteur en Nouvelle-Calédonie et au Queensland, Australie, permettent de montrer que 20 espèces de crabes appartenant à cinq genres de la famille des Trapeziidae vivent dans les eaux de la mer du Corail. Deux de ces espèces appartenant au genre *Trapezia* sont nouvelles. La position systématique de quelques espèces et en particulier de *Trapezia cymodoce* (Herbst, 1801), est aussi révisée.

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INTRODUCTION

All trapeziid crabs are obligate associates of cnidarians. They establish obligate and close associations with their hosts and as such are here referred to as symbionts, members of close heterospecific associations irrespective of harm or benefit to the partners (CASTRO, 1988). They are restricted to the Indo-west Pacific and eastern Pacific regions. Most common and best known are species of *Trapezia* Latreille and *Tetralia* Dana, symbionts of reef corals. Their taxonomy has been in a state of confusion since color pattern rather than morphology best characterizes the species, many of which are sympatric in their respective coral hosts. This investigation thus stresses the importance of recognizing differences in the color pattern of live individuals before attempting the

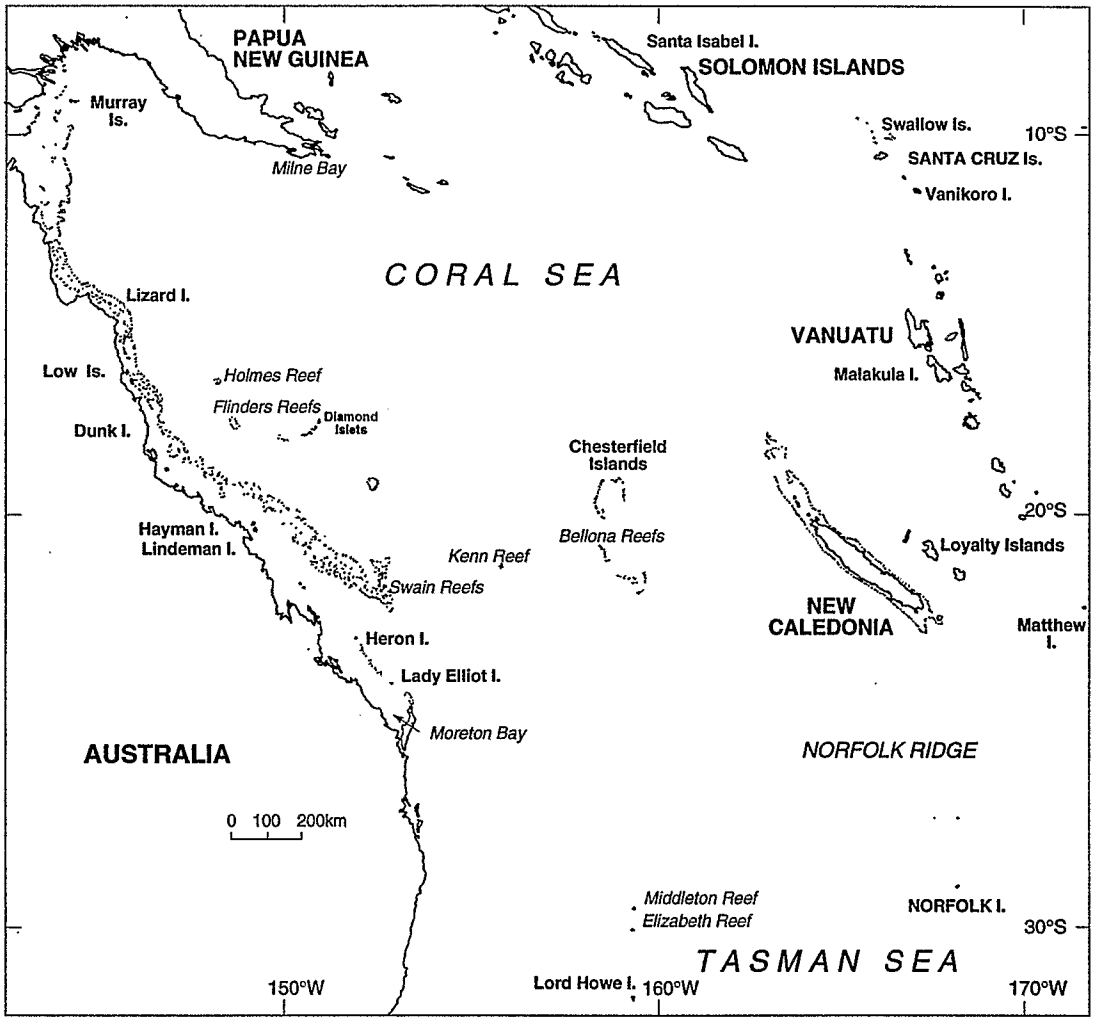

Fig. 1. — Map of the Coral Sea region indicating the locations where the material examined was collected.

identification of museum material.

There are relatively few reports of trapeziids from the eastern and northern Coral Sea. A. MILNE EDWARDS (1873) was the first to record New Caledonian species, followed by reports on small collections by SERÈNE (1973b) and TAKEDA and NUNOMURA (1976). GALIL and CLARK (1990) described the trapeziids from several ORSTOM collections in New Caledonia.

Records of trapeziids from the Coral Sea coast of Australia were included in the general surveys of HASWELL (1882), CALMAN (1900), GRANT and McCULLOUGH (1906), RATHBUN (1923), WARD (1933), as well as in the results of the Great Barrier Reef Expedition (McNEILL, 1968). Additional Australian records were given by BOONE (1934), PATTON (1966), SERÈNE (1984), GALIL and LEWINSOHN (1985b), and GALIL(1988a) ; photographs or illustrations by HEALY and YALDWYN (1970), JONES and MORGAN (1994), and DAVIE (1993). Work on the ecology of trapeziids in Australia has been undertaken by PATTON (1974, 1994), LASSIG (1977), AUSTIN *et al.* (1980), and ABELE (1984).

The synonymy given here for each of the species is generally restricted to the most important synonyms and references. References, however, include all records known for the Coral Sea region. Since color pattern is of crucial importance in the identification of *Trapezia* and *Tetralia*, an effort has been made to include references with color photographs and illustrations. Reexamination of material from outside the Coral Sea has been included in order to reflect the more recent revisions of GALIL (1986a, 1986c, 1988a), GALIL and CLARK (1988), GALIL and LEWINSOHN (1984, 1985a, 1985b), and CASTRO (1982, 1996).

Geographical names in English follow their spelling in the 1993 edition of the *Times Atlas of the World* (Fig. 1). Measurements given for specimens refer to carapace width (cw) and carapace length (cl).

Specimens examined are deposited in the Australian Museum (AM), Sydney, Australia ; Muséum national d'Histoire naturelle (MNHN), Paris, France ; United States National Museum of Natural History, Smithsonian Institution (USNM), Washington, D.C., U.S.A ; Natural History Museum (former British Museum (Natural History), BMNH), London, United Kingdom ; Osaka Museum of Natural History (OMNH), Osaka Japan ; Queensland Museum (QM), Brisbane, Australia ; and Western Australian Museum (WAM), Perth, Australia.

LIST OF SPECIES

Calocarcinus africanus Calman, 1909
Quadrella coronata Dana, 1852
Quadrella maculosa Alcock, 1898
Tetralia cinctipes Paulson, 1875
Tetralia fulva Serène, 1984
Tetralia nigrolineata Serène & Dat, 1957
Tetralia rubridactyla Garth, 1971
Tetraloides heterodactyla (Heller, 1861)
Tetraloides nigrifrons (Dana, 1852)
Trapezia cymodoce (Herbst, 1801)
Trapezia digitalis Latreille, 1828
Trapezia ferruginea Latreille, 1828
Trapezia flavopunctata Eydoux & Souleyet, 1842
Trapezia formosa Smith, 1869
Trapezia guttata Rüppell, 1830
Trapezia lutea **new species**
Trapezia punctipes **new species**
Trapezia rufopunctata (Herbst, 1799)
Trapezia septata Dana, 1852
Trapezia serenei Odinetz, 1984

SYSTEMATIC ACCOUNT

TRAPEZIIDAE Miers, 1886

CALOCARCINUS Calman, 1909

Only four species of *Calocarcinus* are known : *C. africanus* Calman 1909, *C. habei* Takeda, 1980, *C. lewinsohni* Takeda & Galil, 1980, and *C. crosnieri* Galil & Clark, 1990. They all appear to be obligate symbionts of deep-water cnidarians. *C. habei* was recorded from precious coral (TAKEDA, 1980).

The inclusion of *Calocarcinus* in the Trapeziidae has never been critically examined. The morphology of the carapace, abdomen, and male gonopods differs from that of other trapeziids. Furthermore, the similarities in the shape of the chelipeds and the presence of rows of setae on the walking legs may have been the result of convergence. Differences between the structure of the spermatozoon of *Calocarcinus* and that of *Trapezia* have been reported by JAMIESON *et al.* (1993).

Calocarcinus africanus Calman, 1909

Pls. 1 A & 1 B.

Calocarcinus africanus Calman, 1909 : 31, unnumbered figure. — SERÈNE, 1984 : 291, figs 198, 200, pl. 42, fig. F. — GALIL & CLARK, 1990 : 370, fig. 1 (New Caledonia).

MATERIAL EXAMINED. — **New Caledonia.** SMIB 1 : st. DW 10, 22°54'S, 167°12'E, 410 m, 6.2.1986 : 1 ♂, 1 ♀ (MNHN-B 25194). — SMIB 3 : st. DW 12, 23°37.70'S, 167°41.50'E, 470 m, 22.5.1987 : 5 ♂, 10 ♀ (MNHN-B 25203). — St. DW 13, 23°38'S, 167°42'E, 448 m, 22.5.1987 : 1 ♂ (MNHN-B 25204). — BATHUS 2 : st. CP 736, 23°03.38'S, 168°58.96'E, 452-464 m, 13.5.1993 : 1 ♀ (MNHN-B 25210). — St. CP 760, 23°18.87'S, 166°10.55'E, 455 m, 16.5.1993 : 1 ♂ (MNHN-B 25211). — HALIPRO 1 : st. CP 877, 23°02.76'S, 166°57.91'E, 464-480 m, 31.3.1994 : 1 ♀ (MNHN-B 25202).

Norfolk Ridge. BERYX 11 : st. DW 27, 23°37'S, 167°41'E, 460-470m, 18.10.1992 : 2 ♂, 4 ♀ (MNHN-B 25206). — St. DW 31, 23°39'S, 167°44'E, 430-440 m, 18.10.1992 : 2 ♂, 3 ♀ (MNHN-B 25205). — St. CH 49, 23°45'S, 168°17'E, 400-460 m, 21.10.1992 : 1 ♀ (MNHN-B 25207). — St. CH 49, 23°45'S, 168°17'E, 400-460 m, on antipatharian (*Antipathes* sp.), 21.10.1992 : 1 ♀ (MNHN-B 25208). — St. CP 51, 23°44'S, 168°17'E, 390-400 m, on gorgonian (*Fanellia* sp.), 21.10.1992 : 3 ♂, 25 ♀ (MNHN-B 25209). — SMIB 8 : st. DW 166, Stylaster bank, 23°37.80'S, 167°42.70'E, 433-450 m, on scleractinian coral (?), 29.1.1993 : 6 ♂, 6 ♀ (MNHN-B 25195). — St. DW 167, Stylaster bank, 23°38.10'S, 168°43.10'E, 430-552 m, on scleractinian coral (?), 29.1.1993 : 4 ♂, 2 ♀ (MNHN-B 25196). — St. DW 168, Stylaster bank, 23°37.70'S, 168°42.50'E, 433-450 m, 29.1.1993 : 4 ♂, 3 ♀ (MNHN-B 25197). — St. DW 169, Stylaster bank, 23°37.70'S, 167°42.50'E, 447-550 m, 29.1.1993 : 3 ♂, 1 ♀ (MNHN-B 25198). — St. DW 178, East Jumeau Bank, 23°45.10'S, 168°17'E, 400 m, 30.1.1993 : 2 ♂, 3 ♀ (MNHN-B 25199). — St. DW 179, East Jumeau Bank, 23°45.90'S, 168°17'E, 400-405 m, 30.1.1993 : 2 ♂, 3 ♀ (MNHN-B 25200). — St. DW 180, East Jumeau Bank, 22°47.70'S, 168°18.10'E, 460-525 m, 30.1.1993 : 1 ♂, 5 ♀ (MNHN-B 25201). — BATHUS 3 : st. DW 811, 23°41'S, 168°15'E, 383-408 m, on gorgonian (*Fanellia* sp.), 28.11.1993 :19 ♂, 32 ♀ (MNHN-B 25212). — St. DW 812, 23°43.38'S, 168°15.98'E, 391-440m, 28.11.1993 : 11 ♂, 25 ♀ (MNHN-B 25213). — St. DW 813, 23°45'S, 168°17'E, 410-415 m, 28.11.1993 : 10 ♂, 23 ♀ (MNHN-B 25214). — St. DW 814, 23°48'S, 168°17'E, 444-530 m, 28.11.1993 : 5 ♂, 4 ♀ (MNHN-B 25215). — St. DW 815, 23°47'S, 168°17'E, 460-470 m, 28.11.1993 : 1 ♀ (MNHN-B 25216). — St. DW 817, 23°42'S, 168°16'E, 405-410 m, 28.11.1993 : 7 ♂, 9 ♀ (MNHN-B 25217). — St. DW 818, 23°44'S, 168°16'E, 394-401 m, 28.11.1993 : 14 ♂, 27 ♀ (MNHN-B 25218). — St. CH 820, 23°43'S, 168°16'E, 405-411 m, 28.11.1993 : 1 ♂, 1 ♀ (MNHN-B 25219). — St. CP 846, 23°03'S, 168°58'E, 500-514 m, 1.12.1993 : 2 ♂, 1 ♀ (MNHN-B 25220).

Loyalty Is. MUSORSTOM 6 : st. DW 472, 21°08.60'S, 167°54.70'E, 300 m, on alcyonacean (*Siphonogorgia* sp.), 22.2.1989 : 1 ♂ (MNHN-B 25221, photographed). — CALSUB : st. PL 5A, west of Lifou I., 20°47'S, 167°01'E, 130-954 m., on dendrophyllid coral, 24.2.1989 : 1 ♀ (MNHN-B 22637).

REMARKS. — None of the 301 specimens examined from the recent New Caledonia collections agrees with the description of *C. crosnieri* Galil & Clark, which was described from nine specimens collected from one station in northern New Caledonia. *C. crosnieri* was distinguished from *C. africanus* by the longer merus of its chelipeds and the shape of the male pleopods. Examination of the holotype (MNHN-B 18186) and three paratypes (MNHN-B 18187) shows that *C. crosnieri* is very close to *C. africanus*. There is a slight but significant difference ($P < 0.001$, MANN-WHITNEY U-test) between the ratio of the total length of the cheliped merus to that of the propodus in the two species (0.88 for *C. crosnieri*, N = 4 ; 0.77 for *C. africanus*, N = 8) but the most noticeable differences are in the greater total length of the chelipeds and the shorter and stouter first male pleopod of *C.crosnieri*.

In large specimens (cw = 18 mm or more) of *C. africanus* the two pairs of epibranchial teeth are as prominent as in *C. habei* Takeda, another closely related species. In *C. habei*, however, the carapace and chelipeds are noticeably tuberculate.

Some of the specimens dredged from New Caledonian waters were obtained from an antipatharian (probably a species of *Antipathes*), a gorgonian (*Fanellia* sp.), and an alcyonacean (*Siphonogorgia* sp. ; pl. 1 A). One specimen was collected from a dendrophyllid coral, while others were in samples dredged together with fragments of an unidentified ahermatypic scleractinian coral.

Live animals are light orange in color (pl. 1 A). Preserved specimens are creamy white.

In contrast to other trapeziids, which are typically found in heterosexual pairs and the numbers collected are about equal for each sex, a much larger number of females was collected in *C. africanus*. Another difference is that while in other trapeziids most females collected are gravid, in *C. africanus* the number of ovigerous females is very low.

C. africanus was described from the western Indian Ocean and recorded from Indonesia, New Caledonia, and the Chesterfield Islands (GALIL & CLARK, 1990).

QUADRELLA Dana, 1851

All eight species of *Quadrella* so far known (GALIL, 1986c) are symbionts of alcyonaceans, antipatharians, and ahermatypic scleractinian corals. Species are distributed throughout the Indo-west Pacific ; one is endemic to the eastern Pacific. In all species the frontal border of the carapace is divided into four prominent, teeth-like triangular lobes. The slender walking legs are provided with teeth, spines, and rows of setae that are most probably involved in the gathering of mucus from the host (GALIL, 1987).

Quadrella coronata Dana, 1852
Pl. 7 A

Quadrella coronata Dana, 1852a : 84. — GALIL, 1986c : 282, figs 3 E, 4 C-E (full synonymy).

MATERIAL EXAMINED. — **Vanuatu.** MUSORSTOM 8 : st. DW 966, 20°18.8'S, 169°51.91'E, 128-150 m, 21.9.1944 : 1 ♀ (MNHN-B 25765).

REMARKS. — This is the first time this species, known from locations across the Indo-west Pacific region, is recorded from the Coral Sea.

Quadrella maculosa Alcock, 1898
Pl. 7 B

Quadrella coronata var. *maculosa* Alcock, 1898 : 226.

Quadrella maculosa – SERÈNE, 1973a : 204, figs 4, 9, 20-22, pl. 3 ; 1984 : 288, fig. 194, pl. 41, fig. E. — GALIL, 1986c : 285, figs 5 C-F (full synonymy). — GALIL & CLARK, 1990 : 372 (New Caledonia). — ALLEN & STEENE, 1994 : 162 (color photograph). — COLIN & ARNESON, 1995 : 214, fig. 1007 (color photograph).

MATERIAL EXAMINED. — **New Caledonia.** LAGON, east lagoon : st. 601, 22°18.0'S, 167°02.50'E, 47-48 m, on unidentified antipatharian (*Antipathes* sp.), 5.8.1986 : 1 ♂, 1 ♀ (MNHN-B 25190). — EXPEDITION MONTROUZIER : Koumac barrier reef, Deverd Pass, 20°45.20'S, 164°15.20'E, 55-70 m, 22.10.1993 : 1 ♀ (MNHN-B 25187).

Vanuatu. MUSORSTOM 8 : st. DW 988, 19°16.04'S, 169°24.12'E, 372-466 m, 23.9.1994 : 1 ♀ (MNHN-B 25766).

Papua New Guinea. Wall, Madang, on antipatharian, 1985, coll. M. HUBER : 3 ♂, 1 ♀,1 postlarva (USNM 277640).

Belau (Palau). 16 m, on *Parantipathes* sp., 4.7.1974, coll. P. CASTRO : 1 ♂ (USNM 277639).

COLOR. — A live specimen collected in Belau had a light-brown carapace and chelipeds and dark-brown walking legs. The eyes, eyestalks, finger and dactylus of the chelipeds, and the tips of the walking legs were yellow. Specimens shown in ALLEN & STEENE (1994) and COLIN & ARNESON (1995) are dark reddish brown. The dorsal surface of the carapace in preserved specimens is ornamented with a sinuous light-orange pattern (see plate 41, fig. E *in* SERÈNE, 1984).

REMARKS. — This species can be differentiated from the other species of *Quadrella* by having very slender and long walking legs, a conspicuous epibranchial spine that projects from each side of the carapace (two on each side in juveniles), and a cheliped merus that is armed with acute tubercles, spine-like in juveniles.

The type locality of *Q. maculosa* is the Andaman Islands in the Indian Ocean. It is also known from the Red Sea, several locations throughout the Indian Ocean, and Indonesia, the Philippine Islands, Papua New Guinea, Okinawa, New Caledonia, and French Polynesia (SERÈNE, 1973a ; GALIL, 1986c ; GALIL & TAKEDA, 1985 ; GALIL & CLARK, 1990 ; POUPIN, 1996 ; CASTRO, 1997). It is reported here for the first time from Belau (Palau).

TETRALIA Dana, 1851

The taxonomic status of the species of *Tetralia* was for a long time in a state of confusion. Two major species were recognized, each consisting of several subspecies or forms that were defined mostly by color (PATTON, 1966 ; SERÈNE, 1984). A comprehensive revision by GALIL (1986a, 1986b, 1988a, 1988b) and GALIL & CLARK (1988) resulted in nine species distributed among two genera, *Tetralia* and *Tetraloides*. These species are defined by morphology as well as by color pattern.

Most of the seven species that currently comprise the genus *Tetralia* were originally placed in one species, *T. glaberrima* Herbst. The type material is unfortunately lost (GALIL, 1988a). The correct identity of material recorded in the literature by this name is not always possible since in most cases no diagnostic color information was given. In some instances the material in no longer extant.

Tetralia is characterized by two very dissimilar chelipeds, the largest of which has a setae-filled depression at its dorsal, proximal surface. The thoracic sternum has a suture along its middle portion.

All species of *Tetralia* are symbionts of *Acropora*, reef corals of circumtropical distribution. *Tetralia*, however, is only known from the Indo-west Pacific region. Little is know of their biology (CASTRO, 1976). They form heterosexual pairs and feed on mucus produced by their coral host. Mucus is gathered be the setae on the large cheliped and walking legs (KNUDSEN, 1967 ; GALIL, 1987). Crevice-like modifications in the skeleton of the coral host have been reported by ELDREDGE & KROPP (1982).

Tetralia cinctipes Paulson, 1875

Tetralia cinctipes Paulson, 1875 : 60, pl. 7, fig.8. — GALIL, 1986b : 97, figs 1-3 ; 1987 : fig. 3 ; 1988b : 171, fig. 7. — GALIL & CLARK, 1988 : 138, figs 1 A, 3 A, 4 A, 4 F, 5 A, 6 A (full synonymy). — PATTON, 1994 : 195 (Queensland, Australia).

Tetralia glaberrima forma *pullidactyla* Patton, 1966 : 287. — SERÈNE, 1984 : 282, pl. 40, fig. C.

Tetralia glaberrima pullidactyla Garth, 1971 : 185.

Tetralia glaberrima – TAKEDA & NUNOMURA, 1976 : 78 (New Caledonia, part). — JONES & MORGAN, 1994 : 179 (color photograph).

MATERIAL EXAMINED. — **New Caledonia.** LAGON, east lagoon : st. 801, 21°02.0'S, 165°29.30'E, 29 m, 9.1.1987 : 1 ♂ (MNHN-B 25104). — Northwest lagoon : st. DW 946, 20°34.80'S, 164°07.80'E, 16-17m, 28.4.1988 : 3 ♂, 6 ♀ (MNHN-B 25105). — st. DW 947, 20°33.20'S, 164°07.10'E, 17-18 m, 28.4.1988 : 1 ♂ (MNHN-B 25106). — North lagoon : st. DW 1196, 19°32.50'S, 163°21.0'E, 30m, 1.11.1989 : 4 ♂ (MNHN-B 25107).

New Caledonia. Material identified by M. TAKEDA & N. NUNOMURA as *Tetralia glaberrima* : Ile des Pins, Melanesia Expedition, 6-13.11.1958 : 1 ♂, 1 ♀ (OMNH-Ar 1383-1893).

Solomon Islands. Santa Cruz Is., 1926 ?, coll. E. TROUGHTON & A. A. LIVINGSTONE : 1 ♂, 1 juvenile (AM P9165).

Papua New Guinea. Wahoo reef, Milne Bay, 2 m, 23.12.1981, coll. N. COLEMAN : 1 ♀ (AM P39691).

Chesterfield Is. CORAIL 2 : st. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 2 ♂ (MNHN-B 25108).

Holme's Reef. 16°55'S, 145°46'E, 27.9.1960, coll. D. F. McMICHAEL : 3 ♂, 3 ♀ (AM P17031).

Diamond Islets. West Cay, 13°11'S, 143°43'E, 26.10.1964, coll. D. F. McMICHAEL & J. C. YALDWIN : 1 ♂ (AM P17235).

Lord Howe I. Malabar, 31°33'S, 159°05'E, 15 m, 23.2.1980, coll. N. COLEMAN : 1 ♀ (AM P39687).

Niue I. BNIUE-365, Namui area, south of Makapu Pt., outer reef slope, *Acropora*, 4-18 m, 21.10.1991, coll. B. V. HOLTHUIS & G. PAULAY : 1 ♂, 1 ♀ (USNM 277641).

Philippine Islands. MUSORSTOM 2 : st. 73, 13°55.50'N, 120°22.30'E, 20-21 m, 30.11.1980 : 1 ♀ (MNHN-B 16924).

Japan. Material collected and identified by W. K. PATTON as *Tetralia glaberrima* forma *pullidactyla* Patton : Kabira Bay, Ishigaki I., Ryukyu Is., on *Acropora corymbosa*, 19.7.1977 : 3 ♂, 1 ♀ (MNHN-B 8167).

Western Indian Ocean. Material identified by R. SERÈNE as *Tetralia glaberrima pullidactyla* Patton : Réunion, on *Acropora* sp., coll. S. RIBES : 1 ♂, 1 ♀ (MNHN-B 8168). — Zélée Bank, coll. A. J. BRUCE : 1 ♂, 1 ♀ (MNHN-B 8169). — Réunion, lagoon, on *Acropora* sp., coll. S. RIBES, 30.7.1977 : 1 ♂, 1 ♀ (MNHN-B 14044).

COLOR. — Although live material was not collected, the diagnostic color pattern of *T. cinctipes* was evident in the preserved specimens. A color photograph of a specimen identified as *T. glaberrima* by JONES & MORGAN (1994) is actually *T. cinctipes*. The carapace of the specimen is almost white anteriorly, light tan posteriorly.

In small preserved specimens the carapace is light brown ; it is much lighter in large ones. The very edge of the minute teeth along the frontal border of the carapace is red-brown, followed by a thin light-brown band. The anterior portion of the carapace immediately below contains numerous brown granules in small specimens. These granules become less numerous and gray in larger specimens. A brown band extends ventrally across the carapace between the eyestalks. The chelipeds are light tan ventrally and brown dorsally. The merus, carpus, and propodus of the chelipeds have irregular brown spots. The spots become much darker and arranged in a reticulated pattern in larger specimens. The walking legs are light tan with the proximal portion of the carpus, propodus, and dactylus brown, thus giving the legs a banded appearance. The smallest individuals (cw 6 mm and less) show small orange-brown spots on all segments of the walking legs. Spots eventually coalesce and the largest specimens show the characteristic dorsal dark color. Small dots that are observed mostly on the walking legs of small individuals is also characteristic of *Tetralia fulva*.

REMARKS. — In addition to its color pattern, diagnostic to *T. cinctipes* is the presence of abundant small tubercles on the chelipeds. The lower margin of the cheliped propodus is bordered by heavy triangular tubercles. The endopod of the first maxilliped ends at a right angle on its inner side, while the outer side is rounded and lower than the inner side. The distal edge of the endopod is thus slightly concave.

T. cinctipes is known across the Indo-west Pacific region : the Red Sea, Indian Ocean, and from Japan to French Polynesia (GALIL & CLARK, 1988).

Tetralia fulva Serène, 1984
Pl. 1 C

Tetralia glaberrima – A. MILNE EDWARDS, 1873 : 262 (New Caledonia). — TAKEDA & NUNOMURA, 1976 : 78 (New Caledonia, part). — BOONE, 1934 : 174 (part).
Tetralia glaberrima forma *fulva* Patton, 1966 : 286 (Queensland, Australia).
Tetralia glaberrima fulva Serène, 1984 : 282 (Queensland, Australia ; part).
Tetralia fulva – GALIL, 1988a : 62, figs 1b, 2c, 2d (Queensland, Australia ; full synonymy). — PATTON, 1994 : 195, fig. 2 D (Queensland, Australia).
Tetralia sanguineomaculata Galil & Clark, 1990 : 375, figs 4, 5, 6b (New Caledonia).

MATERIAL EXAMINED AND TYPE. — **Queensland, Australia.** Neotype herein designated : Heron I., 23°26'S, 151°55'E, on *Acropora* sp., coll. W. K. PATTON, 23.4.1971 : 1 ♂ neotype, cw 8.4 mm, cl 7.3 mm (MNHN-B 25234).

New Caledonia. LAGON, north lagoon : st. 483, 19°01'S, 163°32'E, 33 m, 2.3.1985 : 1 ♂ (MNHN-B 25109). — St. DW 1088, 19°45.50'S, 163°57.70'E, 23 m, 24.10.1989 : 2 ♂, 2 ♀ (MNHN-B 25110). — St. DW 1105, 19°40.0'S, 163°57.0'E, 25.10.1989, 25 m, 25.10.1989 : 1 ♀ (MNHN-B 25111). — St. DW 1128, 19°31.20'S, 163°52.20'E, 26 m, 26.10.1989 : 2 ♂, 1 ♀ (MNHN-B 25112). — St. DW 1139, 19°23.60'S, 163°47.0'E, 39 m, 27.10.1989 : 1 ♀ (MNHN-B 25113). — St. DW 1189, 19°32.10'S, 163°34.20'E, 20 m, 1.11.1989 : 1 ♂, 1 ♀ (MNHN-B 25114). — East lagoon : st. 625, 21°59.20'S, 166°53.60'E, 34-40 m, 6.8.1986 : 2 ♂, 1 ♀ (MNHN-B 25115). — St. 641, 21°53.0'S, 166°4.0'E, 50-52 m, 7.8.1986 : 1 ♀ (MNHN-B 25116). — St. 659, 21°45.30'S, 166°33.40'E, 46-48 m, 8.8.1986 : 1 ♂ (MNHN-B 25117). — St. 668, 21°40.50'S, 166°29.10'E, 40 m, 8.8.1986 : 1 ♂ (MNHN-B 25118). — St. 799, 20°58.50'S, 165°31.70'E, 32 m, 9.1.1987 : 1 ♂ (MNHN-B 25119). — St. 895, 20°15.50'S, 164°26.80'E, 16 m, 14.1.1987 : 1 ♀ (MNHN-B 25120). — St. 899, 20°14.20'S, 164°25.15'E, 16 m, 14.1.1987 : 1 ♀ (MNHN-B 25121). — Northwest lagoon : st. DW 946, 20°34.80'S,

164°07.80'E, 16-17 m, 28.4.1988 : 5 ♂, 2 ♀ (MNHN-B 25122). — St. DW 1006, 20°12.50'S, 163°54.60'E, 18-25 m, 2.5.1988 : 1 ♂, 1 ♀ (MNHN-B 25123). — St. DW 1046, 20°05.0'S, 164°06.60'E, 6-7 m, 4.5.1988 : 1 ♂, 1 ♀ (MNHN-B 25124).

New Caledonia. St. 140, Sêche Croissant reef, 22°19.90'S, 166°22.30'E, 13 m, on *Acropora* spp., 26.4.1995, coll. P. CASTRO : 4 ♂, 3 ♀ (MNHN-B 25125). — St. 107, Boulari Pass, 22°29.90'S, 166°26.55'E, 10-20 m, on *Acropora* spp., 28.4.1995, coll. P. HAMEL : 3 ♂, 5 ♀ (MNHN-B 25126), 1 ♂, 2 ♀ (USNM 277636). — Récif M'bere, pente externe, 25-30 m, 7.1.1993 : 2 ♂, 1 ♀ (MNHN-B 25364). — Récif M'bere, pente externe, 10-15 m, 7.1.1993 : 1 ♂, 1 ♀ (MNHN-B 25369). — Récif M'bere, pente externe, 10 m, 5.5.1993 : 1 ♂ (MNHN-B 25368).

New Caledonia. Material identified by A. MILNE EDWARDS as *Tetralia glaberrima* (Herbst) : 1 ♂ (MNHN-B 2907). — 3 ♂, 3 ♀ (MNHN-B 4346). — Material identified by M. TAKEDA & N. NUNOMURA as *Tetralia glaberrima* (Herbst) : Ile des Pins, Melanesia Expedition, 6-13.11.1958 : 5 ♂, 4 ♀ (OMNH-Ar 1383-1393). — Material identified by B. GALIL & P. CLARK as *Tetralia sanguineomaculata* Galil & Clark : st. 436, 27.2.1985 : 1 ♂, holotype (MNHN-B 20670). — St. 436, 27.2.1985 : 1 ♀, paratype (MNHN-B 20773). — St. 463, 1.3.1985 : 1 ♂, 1 ♀, paratype (MNHN-B 20779). — LAGON : st. 6, 21.5.1984 : 2 ♂, 2 ♀ (MNHN-B 20663). — St. 77, 21.8.1984 : 1 ♂, 2 ♀ (MNHN-B 20776). — St. 159, 24.8.1984 : 1 ♀ (MNHN-B 20775). — St. 82, 28.8.1984 : 1 ♂, 1 ♀ (MNHN-B 20779). — St. 341, 28.11.1984 : 1 ♂, 1 ♀ (MNHN-B 20771). — St. 459, 1.3.1985 : 1 ♂ (MNHN-B 20669). — St. 460, 1.3.1985 : 1 ♂ (MNHN-B 20668). — St. 461, 1.3.1985 : 2 ♀ (MNHN-B 20778). — St. 480, 2.3.1985 : 3 ♂, 1 ♀ (MNHN-B 20667). — St. 483, 2.3.1985 : 1 ♂ (MNHN-B 20665). — St. 489, 3.3.1985 : 1 ♂ (MNHN-B 20774). — St. 521, 5.3.1985 : 1 ♂, 1 ♀ (MNHN-B 20777). — St. 551, 15.7.1985 : 1 ♂, 1 ♀ (MNHN-B 20772). — St. 588, 18.7.1985 : 1 ♂, 2 ♀ (MNHN-B 20666). — St. 412, 24.10.1985 : 1 ♂ (MNHN-B 20664).

Loyalty Is. MUSORSTOM 6 : st. DW 431, 20°22.25'S, 166°10.0'E, 21 m, 18.2.1989 : 1 ♂, 1 ♀ (MNHN-B 25127). — PLOUVEAL : st.1226, Ouvéa lagoon, 20°32.0'S, 166°24.0'E, 21 m, 9.9.1992, coll. R. LEBORGNE : 2 ♂, 3 ♀ (MNHN-B 25130). — St. 1229, Ouvéa lagoon, 20°37.10'S, 166°22.90'E, 16 m, 9.9.1992, coll. R. LEBORGNE : 1 ♂ (MNHN-B 25132). — St. 1231, Ouvéa lagoon, 20°31.20'S, 166°22.90'E, 23 m, 9.9.1992, coll. R. LEBORGNE : 1 ♂, 3 ♀ (MNHN-B 25134). — St. 1219, Ouvéa lagoon, 20°30.0'S, 166°28.0'E, 15 m, 11.9.1992, coll. R. LEBORGNE : 1 ♂ (MNHN-B 25128). — St. 1222, Ouvéa lagoon, 20°28.0'S, 166°30.0'E, 15 m, 12.9.1992, coll. R. LEBORGNE : 2 ♂, 2 ♀ (MNHN-B 25129). — St. 1227, Ouvéa lagoon, 20°36.90'S, 166°25.0'E, 12 m, 15.9.1992, coll. R. LEBORGNE : 1 ♂, 1 ♀ (MNHN-B 25131). — St. 1230, Ouvéa lagoon, 20°35.0'S, 166°22.90'E, 18 m, 15.9.1992, coll. R. LEBORGNE : 1 ♀ (MNHN-B 25133).

Chesterfield Is. CHALCAL 1 : st. D 24, 19°10.78'S, 158°37.10'E, 38 m, 18.7.1984 : 1 ♀ (MNHN-B 25135). — CORAIL 2 : st. DW 35, 19°21.65'S, 158°52.69'E, 52 m, 23.7.1988 : 1 ♀ (MNHN-B 25136). — St. DW 46, 19°18.54'S, 158°20.0'E, 21 m, 23.7.1988 : 2 ♂ (MNHN-B 25137). — St. DW 84, 19°12.0'S, 158°56.80'E, 16-26 m, 25.8.1988 : 1 ♂ (MNHN-B 251138). — St. DW 88, 19°05.98'S, 158°55.85'E, 32 m, 26.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25139). — St. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 4 ♂, 3 ♀ (MNHN-B 25140). — St. CP 90, 19°02.83'S, 158°56.26'E, 44-48 m, 26.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25141). — St. DW 97, 19°06.0'S, 158°38.43'E, 32 m, 27.8.1988 : 1 ♂, 2 ♀ (MNHN-B 25142). — St. DW 99, 19°06.03'S, 158°38.95'E, 52 m, 27.8.1988 : 1 ♂ (MNHN-B 25143). — St. DW 105, 19°08.91'S, 158°39.19'E, 35 m, 27.8.1988 : 2 ♂ (MNHN-B 25144). — St. DW 115, 19°22.01'S, 158°37.62'E, 44 m, 28.8.1988 : 1 ♀ (MNHN-B 25145). — St. DW 116, 19°23.09'S, 158°34.68'E, 52 m, 28.8.1988 : 1 ♂ (MNHN-B 25146). — St. DW 126, 19°28.07'S, 158°27.0'E, 46 m, 29.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25147). — St. DW 127, 19°27.73'S, 158°27.30'E, 44-45 m, 29.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25148). — St. DW 137, 19°34.0'S, 158°14.60'E, 32 m, 30.8.1988 : 1 ♀ (MNHN-B 25149). — St. DW 143, 19°37.40'S, 158°25.16'E, 45 m, 30.8.1988 : 1 ♂ (MNHN-B 25150). — St. DW 144, 19°27.73'S, 158°23.28'E, 50 m, 30.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25151). — St. DW 145, 19°37.0'S, 158°19.12'E, 54 m, 30.8.1988 : 1 ♀ (MNHN-B 25152). — St. DW 153, 19°52.0'S, 159°23.20'E, 45 m, 1.9.1988 : 2 ♂ (MNHN-B 25153). — St. DW 163, 19°41.46'S , 158°15.62'E, 23 m, 2.9.1988 : 1 ♂, 1 ♀ (MNHN-B 25154). — St. DW 165, 19°41,41'S, 158°21.85'E, 45 m, 2.9.1988 : 2 ♀ (MNHN-B 25155). — St. DW 166, 19°41.49'S, 158°25.24'E, 56 m, 2.9.1988 : 1 ♂ (MNHN-B 25156).

Bellona Reefs. St. DE 9, 21°23.70'S, 158°54.20'E, 47-51 m, 20.10.1985 : 1 ♂ (MNHN-B 25157).

Vanuatu. 1 ♂, 2 ♀ (BMNH 1896.1.2.29-33). — 2 ♂, 1 ♀ (BMNH 1896.1.2.54-7).

Solomon Islands. Santa Cruz Is., 1926 ?, coll. E. TROUGHTON & A. A. LIVINGSTONE : 1 ♀ (AM P46260). — Carlisle Bay, Santa Cruz (= Ndeni) I., Santa Cruz Is., 20.7.1926, coll. E. TROUGHTON & A. A. LIVINGSTONE : 1 ♂ (AM P9181). — Tanabula Harbor, Santa Isabell., coll. N.S. HEFFEMAN : 2 ♂, 2 ♀ (AM P8079).

Queensland, Australia. Cairns Reef, Cooktown, 15°28'S, 145°15'E, 1905, coll. A. R. McCULLOCH : 2 ♂, 3 ♀ (AM P3733). — Murray I., Torres Strait, 09°56'S, 144°04'E, 8.1907, coll. A. R. McCULLOCH & C. HADLEY : 1 ♂, 2 ♀ (AM

P2865). — One Tree I., Capricorn Group, 23°30'S, 152°05'E, on *Acropora hyacinthus*, 11-12.1966, coll. J. C. YALDWYN : 1 ♂, 2 ♀ (AM P15966). — Reef 1 km south west of Research Point, Lizard Island, 14°40'S, 145°28'E, 3 m, on *Acropora* spp., 9.6.1995, coll. P. CASTRO & R. SPRINGTHORPE : 4 ♂, 1 ♀ (AM P44621, photographed). — Granite Bluff, Lizard Island, 14°40'S, 145°28'E, 4 m, on *Acropora* sp., 11.6.1995, coll. P. CASTRO, R. SPRINGTHORPE & K. BUCKLEY : 2 ♂ (AM P44630). — Hayman I., 20°03'S, 148°53'E, coll. E. H. RAINFORD : 2 ♂, 2 ♀ (AM P7293).

Queensland, Australia. Material collected and identified by W. K. PATTON as *Tetralia glaberrima* forma *fulva* Patton : Heron I., on *Acropora* sp., 22.4.1971 : 1 ♂, 1 ♀ (MNHN-B 8170). — Heron I., on *Acropora* sp., 23.4.1971 : 1 ♂, 1 ♀ (MNHN-B 8171). — Heron I., on *Acropora* sp., 23.4.1971 : 1 ♀ (MNHN-B 8173). — Heron I., on *Acropora* sp., 24.4.1971 : 1 ♂, 1 ♀ (MNHN-B 8172).

DESCRIPTION OF NEOTYPE. — Carapace smooth, shiny, and slightly broader than long. Posterolateral borders straight. Frontal border arched, armed with minute teeth, and demarcated from equally denticulate supraorbital angle by slight break.

Chelipeds markedly unequal, larger one with proximal shallow depression filled with short setae. Carpus with denticulate anterior border slightly raised above distal edge. Left merus with two minute spines on anterior margin ; right with one. First pleopod short and stout, with symmetrical, pointed apex, and bordered distally with short setae. Distal margin of endopod of first maxilliped with few setae ; inner margin square, outer margin slightly round.

Frontal border of carapace slightly darker in color ; thin, colorless stripe immediately below teeth. Anterolateral border of carapace slightly darker. Anterior border of merus and carpus slightly reddish. Dark spot on distal joint of propodus of walking legs.

COLOR. — The carapace of live individuals (pl. 1 C) varies from orange-brown to light pink-brown (peach). A thin orange to red-orange line, bordered in most individuals by a wider light-gray band, extends along the anterior border of the carapace. A faint gray band is usually present along the anterolateral borders of the carapace. The chelipeds are orange brown, slightly darker on the dorsal surface. A dark-orange line extends along the distal edge of the carpus and the anterior border of the merus. A black spot may be found at both articulations of the carpus in some individuals. The walking legs are orange brown, with a black spot at the distal end of the merus and another, much larger, at the propodal joint. The merus, carpus, and propodus have minute black dots ; the dactylus orange-red spots, some elongated. Small red dots may be present on the carpus, propodus, and dactylus of the walking legs of small individuals, and on the propodus of a few larger ones.

One of the three color plates given by SAKAI (1976) as *T.glaberrima* (pl. 183, fig. 4) may actually represent *T. fulva.*

REMARKS. — The species name takes the authorship of SERÈNE (1984), not of PATTON (1966), since the latter referred to it as a "form" and as such is invalid as it was published after 1960 (article 45 (g) of the International Code of Zoological Nomenclature).

No type material was ever designated. A specimen from material collected and identified by W. K. PATTON was selected as the neotype. It was collected at Heron I., Queensland, one of the Australian locations where PATTON (1966) obtained material used in the description of his color form.

T. fulva is the most common species of *Tetralia* in the Coral Sea region (also see PATTON, 1994). It can be easily identified by its color pattern. The color markings, however, may be lost after several years of preservation so that specimens can be confused with *T. nigrolineata*, with which it co-inhabits. Preserved specimens of *T. fulva* may show a dark band along the anterior border of the carapace. This band, however, is diagnostic for *T. nigrolineata*, where it is much darker and followed by a lighter band. In addition, preserved specimens of *T. fulva* will rarely show a distinct dark band along the anterolateral sides of the carapace, which is generally present in preserved *T. nigrolineata*. There are two distinctive black dots on each of the walking legs of *T. fulva*, while there may be only one in *T. nigrolineata*.

One diagnostic morphological character is the shape of the endopod of the first maxilliped. The inner side ends at a right angle and the outer edge is round in *T. fulva*, while it is rounded on both sides in *T. nigrolineata* (see fig. 2 *in* GALIL, 1988a). The posterolateral sides of the carapace are straight, thus giving it a trapezoidal shape. The

straight shape, however, is obscured in large females. *T. nigrolineata*, in contrast, has slightly rounded posterolateral sides. Both these characters are unfortunately reversed in the key to the species of *Tetralia* given by GALIL (1988a).

Although GALIL (1988a) characterized *T. fulva* as lacking a "crest", a definite denticulate extension of the anterior border of the cheliped merus is observed in all members of the species, particularly in small individuals. The development of the crest varies, even between the right and left cheliped of the same individual. The crest of *T. fulva* is nevertheless not as prominent as in *T. rubridactyla* (see discussion of *T. rubridactyla*).

Populations of *T. fulva* from the southwestern Indian Ocean share diagnostic morphological features with the western Pacific populations of the same species. The Madagascar specimens that were examined (MNHN-B 8179), however, may have lost any distinctive color pattern that could have identified them as a different species.

The endopod of the first maxilliped of only two of the seven dried specimens from New Caledonia (MNHN-B 2907, 4346) identified by A. MILNE EDWARDS (1873) as *T. glaberrima* could be examined. It is thus possible that this material may include *T. nigrolineata* as no trace of color remains and the shape of the endopod of the first maxilliped is the most reliable morphological difference between the two species. The New Caledonia material identified by SERÈNE (1973b) as *T. glaberrima* most probably included *T. fulva*.

T. sanguineomaculata Galil & Clark (1990), described from New Caledonia, is a junior synonym of *T. fulva*. It was recognized as "similar" to *T. fulva* except for the presence of "reddish spots on pereiopods" (GALIL & CLARK, 1990). Red spots were observed on the propodus, carpus, and dactylus of the walking legs of the holotype (MNHN-B 21670) and in three paratype specimens (MNHN-B 20773 & 20779) of *T. sanguineomaculata*. In the additional New Caledonia material of the new species examined by B. GALIL & P. CLARK (MNHN-B 20663-20669, 206671, 206672, 206674-206678, 206680), red spots occur on the dactylus of the walking legs of most specimens but extend to the carpus and propodus only in small individuals such as the ones included in the type material. Some spots can be seen on the carpus in a photograph of the holotype, a very small individual (GALIL & CLARK, 1990 ; fig. 6b). A similar spotting of the walking legs in only young individuals is also found in *T. cinctipes*. The remaining New Caledonia material as well as seven individuals collected live at Lizard Island, Queensland, Australia (AM P44621 & P44630) show characteristics similar to the *T. sanguineomaculata* material examined by GALIL & CLARK (1990).

T. fulva is known from locations between Indonesia and French Polynesia (GALIL, 1988a) as well as from the western Indian Ocean (SERÈNE, 1984).

Tetralia nigrolineata Serène & Dat, 1957
Pl. 1 D

Tetralia glaberrima – CALMAN, 1900 : 20 (Queensland, Australia ; part). — WARD, 1933 : 255 (Queensland, Australia). — BOONE, 1934 : 174, pl. 89 (Queensland, Australia ; part). — TAKEDA & NUNOMURA, 1976 : 78 (New Caledonia, part). — MIYAKE, 1983 : 139, pl. 47, fig. 4 (color photograph).

Tetralia glaberrima forma *nigrolineata* Serène & Dat, 1957 : 120.

Tetralia glaberrima forma *obscura* Patton, 1966 : 287 (Queensland, Australia).

Tetralia glaberrima obscura – SERÈNE, 1984 : 283, pl. 40, fig. E (Queensland, Australia).

Tetralia nigrolineata – GALIL, 1988a : 63, figs 1c, 2e, 2f (Queensland, Australia ; full synonymy). — PATTON, 1994 :195 (Queensland, Australia).

MATERIAL EXAMINED AND TYPE. — **Queensland, Australia.** Neotype herein designated : Heron I., 23°26'S, 151°55'E, on *Acropora* sp., coll. W. K. PATTON, 21.4.1971 : 1 ♂ neotype, cw 8.8 mm, cl 7.8 mm (MNHN-B 25235).

New Caledonia. LAGON, east lagoon : st. 651, 21°48.0'S, 166°36.40'E, 48 m, 7.8.1986 : 2 ♂ (MNHN-B 25158). — Northwest lagoon : st. DW 946, 20°34.80'S, 164°07.80'E, 16-17 m, 28.4.1988 : 4 ♂, 2 ♀ (MNHN-B 25159). — St. DW 971, 20°25.80'S, 163°59.50'E, 25-26 m, 29.4.1988 : 1 ♂ (MNHN-B 25189). — North lagoon : st. DW 1088, 19°45.50'S, 163°57.70'E, 24.10.1989 : 1 ♀ (MNHN-B 25160). — St. DW 1139, 19°23.60'S, 163°47.0'E, 39 m, 27.10.1989 : 1 ♂ (MNHN-B 25161). — St. DW 1196, 19°32.50'S, 163°21.0'E, 30 m, 1.11.1989 : 1 ♂ (MNHN-B 25162). — St. 140 , Sêche Croissant reef, 22°19.90'S, 166°22.30'E, 13 m, on *Acropora* spp., 26.4.1995, coll. P. CASTRO : 2 ♂, 2 ♀ (MNHN-B 25163), 2 ♂, 1 ♀ (USNM 277637). — St. 107, Boulari Pass, 22°29.90'S, 166°26.55'E, 10-20 m, 28.4.1995, on *Acropora* sp., coll. P. HAMEL : 1 ♂, 1 ♀ (MNHN-B 2564).

Loyalty Is. MUSORSTOM 6 : st. DW 431, 20°22.25'S, 166°10.0'E, 21 m, 18.2.1989 : 1 ♀ (MNHN-B 25165). — PLOUVEAL : st. 1219, Ouvéa lagoon, 20°30.0'S, 166°28.0'E, 15 m, 11.9.1992, coll. R. LEBORGNE : 1 ♀ (MNHN-B 25166). — St. 1227, Ouvéa lagoon, 20°36.90'S, 166°25.0'E, 12 m, 15.9.1992, coll. R. LEBORGNE : 1 ♀ (MNHN-B 25167). — Ouvéa lagoon, 1992 : 1 ♂ (MNHN-B 25168).

Solomon Islands. Peu, Vanikoro I., Santa Cruz Is., 16.8.1926, coll. E. TROUGHTON & A. A. LIVINGSTONE : 2 ♂, 1 ♀ (AM P 9194).

Chesterfield Is. CHALCAL 1 : st. D 34, 19°52.10'S, 158°20.10'E, 33-37 m, 21.7.1984 : 1 ♀ (MNHN-B 25169). — CORAIL 2 : st. DW 43, 19°21.49'S, 158°25.98'E, 52 m, 23.7.1988 : 1 ♀ (MNHN-B 25170). — St. DW 84, 19°12.0'S, 158°56.80'E, 16-26 m, 25.8.1988 : 2 ♂, 1 ♀ (MNHN-B 25171). — St. DW 85, 19°12.85'S, 158°56.26'E, 32 m, 26.8.1988 : 1 ♂ (MNHN-B 25172). — St. DW 88, 19°05.98'S, 158°55.85'E, 32 m, 26.8.1988 : 1 ♂ (MNHN-B 25173). — St. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 5 ♂, 1 ♀ (MNHN-B 25174). — St. DW 116, 19°23.09'S, 158°34.68'E, 52 m, 28.8.1988 : 1 ♂ (MNHN-B 25175). — St. DW 128, 19°27.89'S, 158°30.44'E, 38 m, 29.8.1988 : 1 ♂ (with bopyrid) (MNHN-B 25176). — St. DW 144, 19°27.73'S, 158°23.28'E, 50 m, 30.8.1988 : 1 ♂ (MNHN-B 25177). — St. DW 148, 19°54.08'S, 158°27.12'E, 34 m, 1.9.1988 : 1 ♀ (MNHN-B 25178). — St. DW 159, 19°46.04'S, 158°19.98'E, 52 m, 1.9.1988 : 1 ♂, 1 ♀ (MNHN-B 25179).

Bellona Reefs. St. 4 DE, 21°19.0'S, 158°48.0'E, 66 m, 19.10.1985 : 1 ♂, 1 ♀ (MNHN-B 25180). — CORAIL 1 : 10.8.1988 : 1 ♂ (MNHN-B 25181).

Queensland, Australia. High I., Frankland Group, 17°11'S, 146°04'E, 7.1924, coll. W. E. G. PARADICE : 2 ♀ (AM P7978). — North West I., Capricorn Group, 23°18'S, 151°42'E, 1926, coll. M. WARD : 2 ♀ (AM P45434). — Moreton Bay, 22.8.1941 : 1 ♀ (QM W12316). — Gillett Cay, Swain Reefs, Swain Reefs Expedition, 21°43'S, 152°25'E, 17.10.1962 : 1 ♀ (AM P17211, photographed). — Wistari Reef, Capricorn Group, on *Pocillopora* sp., 6.10.1979, coll. L. OWENS : 1 ♀ (QM W11018). — Reef 1 km south west of Research Point, Lizard Island, 14°40'S, 145°28'E, 3 m, on *Acropora* sp., 8.6.1995, coll. P. CASTRO & R. SPRINGTHORPE : 1 ♂, 1 ♀ (AM P44626, photographed). — Reef 1 km south west of Research Point, Lizard Island, 14°40'S, 145°28'E, 3 m, on *Acropora* sp., 9.6.1995, coll. P. CASTRO & R. SPRINGTHORPE : 1 ♂, 1 ♀ (AM P44620, photographed). — Granite Bluff, Lizard Island, 14°40'S, 145°28'E, 4 m, on *Acropora* sp., 11.6.1995, coll. P. CASTRO, R. SPRINGTHORPE & K. BUCKLEY : 1 ♂, 1 ♀ (AM P44623). — Granite Bluff, Lizard Island, 14°40'S, 145°28'E, 4 m, on *Acropora* sp., 11.6.1995, coll. P. CASTRO, R. SPRINGTHORPE & K. BUCKLEY : 2 ♂, 1 ♀ (AM P44624).

Queensland, Australia. Material collected and identified by W. K. PATTON as *Tetralia glaberrima* forma *obscura* Patton : Heron I., on *Acropora* sp., 21.4.1971 : 1 ♀ (MNHN-B 8175). — Heron I., on *Acropora* sp., 22.4.1971 : 1 ♂, 1 ♀ (MNHN-B 13915). — Heron I., on *Acropora* sp., 23.4.1971 : 1 ♂, 1 ♀ (MNHN-B 8176). — Heron I., on *Acropora* sp., 23.4.1971 : 1 ♂, 1 ♀ (MNHN-B 8177).

Malaysia. Material collected and identified by R. SERÈNE as *Tetralia glaberrima nigrifrons* Dana, 1852 : Perhentian I., 6°55'N, 102°45'E, 21.7.1965 : 5 ♀ (MNHN-B 21390), 1 ♂, 1 ♀ (MNHN-B 21391)., 1 ♂ (MNHN-B 21392), 1 ♀ (MNHN-B 21393)., 1 ♂ 1 ♀ (MNHN-B 21394). — 23.7.1965 : 7 ♂, 8 ♀ (MNHN-B 21388). — 23.7.1965 : 4 ♂, 7 ♀ (MNHN-B 21389).

DESCRIPTION OF NEOTYPE (see pl. 40, fig. E of SERÈNE, 1984). — Carapace smooth, shiny, and slightly broader than long. Posterolateral borders slightly rounded. Frontal border arched, armed with minute teeth, and demarcated from equally denticulate supraorbital angle by very slight break.

Chelipeds markedly unequal, larger one with proximal shallow depression filled with short setae. Carpus with denticulate anterior border. Right merus with two spines on anterior margin ; none on left. First pleopod short and stout, with symmetrical, pointed apex and bordered distally with short setae. Distal margin of endopod of first maxilliped bordered by setae ; inner and outer margins rounded.

Frontal border of carapace dark brown ; thin, colorless dark stripe immediately below. Anterolateral borders also much darker than rest of carapace and bordered by light line along inner boundary. Walking legs uniform dark brown except lighter dactylus.

COLOR. — Carapace, chelipeds, and walking legs of live individuals varies from orange-brown to light pink-brown (peach). The anterior border has a thin orange-brown to red-orange stripe followed by a broad dark-brown to black band that extends across the anterior edge of the eyestalks to the eyes. The black band is followed by a

thin blue-green stripe that also extends to the eyes. The sides of the carapace also have a broad black band followed by a thin blue-green stripe. The cheliped propodus often shows dark-brown reticulations ; its proximal edge is red-brown. The edges of the merus and carpus are ornamented with an orange-red line. The walking legs show minute dark orange-brown dots and a larger dot at the distal joint of the propodus.

Significant variations in the color of live individuals were observed. One from New Caledonia (MNHN-B 25163) had a much darker carapace, almost black, while another from Queensland, Australia (AM P 44620, see pl. 1 D) had a very light carapace, almost white and light-gray chelipeds and legs. Both were males paired with females that showed the normal color pattern.

One of three color plates given by SAKAI (1976) as *T. glaberrima* (pl. 183, fig. 2) may be in fact *T. nigrolineata.*

REMARKS. — This species must retain the name given by SERÈNE & DAT (1957), even if referred to as a "form" by them, since the name was published before 1960 and as such it has a valid subspecific rank (article 45 (g) of the International Code of Zoological Nomenclature). The color characteristics given by SERÈNE & DAT (1957) are accurate enough to consider the description valid (see GALIL, 1988a).

A specimen from material collected and identified by W. K. PATTON and also used by SERÈNE (1984) to illustrate the species was selected as the neotype. No type was ever designated and the material used in the original description of the color form by PATTON (1966) is no longer extant. The neotype was collected at Heron I., Queensland, one of the Australian locations where W. K. PATTON collected material used in his description.

T. nigrolineata is morphologically very close to *T. fulva.* They can be differentiated by their color pattern. Live *T. nigrolineata* show a conspicuous dark band, followed by a thinner and lighter one, along the anterior as well as the anterolateral sides of the carapace. The dark bands, and sometimes the light ones as well, will remain visible in material that has been preserved for decades. The dark band is thinner, not followed by a light band, and is present only along the anterior border of the carapace in *T. fulva.* Darker, thinner anterolateral borders, however, may be observed in live *T. fulva*, rarely in specimens preserved for several years. Each walking leg usually has one conspicuous black dot, while there are two in *T. fulva.*

One diagnostic morphological character is the shape of the endopod of the first maxilliped. It is spatulate, with rounded edges along both inner and outer margins (see fig. 2 *in* GALIL, 1988a). The posterolateral borders of the carapace are slightly rounded, giving the carapace a rounded shape. The borders are more straight in *T. fulva*, particularly in males, hence the trapezoidal shape of the carapace (characters reversed in the key given by GALIL, 1988a).

As in *T. fulva*, the anterior border of the cheliped merus is armed with a row of teeth that is usually prolonged outward and takes the form of a crest. Although not as prominent as in *T. rubridactyla*, the crest varies in shape, even between the merus of both chelipeds in some. It is also relatively much larger in the smaller individuals.

Specimens from New Caledonia reported as *T. glaberrima* by SERÈNE (1973b) may have included *T. nigrolineata.*

T. nigrolineata was the second most common species of *Tetralia* after *T. fulva* in all collections made by this author in New Caledonia and Australia. Similar results were obtained by PATTON (1994) in Australia.

T. nigrolineata is known from localities stretching from the western Indian Ocean (SERENE, 1984) to Japan, Thailand and New Caledonia (GALIL, 1988a).

Tetralia rubridactyla Garth, 1971
Pl. 1 E

Tetralia glaberrima forma *rubridactyla* Patton, 1966 : 287 (Queensland, Australia).
Tetralia glaberrima rubridactyla Garth, 1971 : 185.
Tetralia glaberrima laevissima – SERÈNE, 1984 : 282, fig. 188, pl. 40, figs A, B (Queensland, Australia).
Tetralia rubridactyla – GALIL, 1988a : 65, figs 1d, 2g, 2h (Queensland, Australia ; full synonymy). — PATTON, 1994 : 195 (Queensland, Australia).

MATERIAL EXAMINED. — **Chesterfield Is.** CORAIL 2 : st. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 3 ♂, 1

♀ (MNHN-B 25182).

Queensland, Australia. Cairns Reef, Cooktown, 15°42'S, 145°34'E, 8.1913, coll. A. R. McCULLOCH : 2 ♂ (AM P38477). — Capre Cay, Swain Reefs, 22°09'S, 152°46'E, Swain Reefs Expedition, 10.1962 : 1 ♂, 1 ♀ (AM P17214). — Granite Bluff, Lizard Island, 14°40'S, 145°28'E, 4 m, on *Acropora* sp., 10.6.1995, coll. P. CASTRO, R. SPRINGTHORPE & K. BUCKLEY : 1 ♂ with cirriped, 1 ♀ (AM P44617, photographed).

COLOR. — The anterior half of the carapace is pink-purple to lavender, while the posterior half is very light brown or tan (pl. 1 E). A thin, dark-brown line extends along the anterior border of the carapace, followed by a broad band of diffuse dark-purple or gray dots. The postorbital angle is also dark brown followed by a diffuse band of dark dots extending along the anterolateral margins below. The chelipeds are light brown, with the dorsal surface darker brown. The distal portion of the dorsal surface of the dactylus is orange-red ; the proximal portion dark brown in some individuals. Dark-brown patches extend along the distal border of the merus (beginning at the edge of the crest), the distal edge of the carpus, and at the proximal portion of the propodus. The walking legs are pink-purple dorsally ; the carpus, propodus, and dactylus have a distinctive red spot at their distal end.

REMARKS. — The species name takes the authorship of GARTH (1971) not of PATTON (1966) since the latter referred to it as a "form" and as such is invalid as it was published after 1960 (article 45 (g) of the International Code of Zoological Nomenclature).

The species can be easily identified by its distinctive color pattern, most of which (including the striking colors of the chelipeds) can still be observed in preserved specimens. One diagnostic morphological character is the prominent crest on the cheliped merus. The endopod of the first maxilliped is rectangular in shape, both the inner and outer borders ending at nearly right angles (see fig. 2 *in* GALIL, 1988a).

T. rubridactyla is known from the western Indian Ocean (SERENE, 1984) and in the Pacific Ocean from Taiwan and the Mariana Islands to the Coral Sea and the Marshall Islands (GALIL, 1988a).

TETRALOIDES Galil, 1986

The genus *Tetraloides* was created by GALIL (1986a) to accommodate one species, *Tetraloides nigrifrons* (Dana), material of which was previously included among several species of *Tetralia. T. nigrifrons* was eventually found to actually consist of two different species (GALIL & CLARK, 1988).

Tetraloides, like *Tetralia*, can be readily differentiated from other trapeziids by the presence of two very unequal chelipeds. Unlike *Tetralia*, however, the posterolateral margins of the carapace of *Tetraloides* are strongly convergent posteriorly, there is no setae-filled depression on the largest cheliped, and the thoracic sternum has no median suture. While the dorsal surface of the carapace of *Tetralia* is smooth, in *Tetraloides* it has small tubercles and short setae, particularly in *Tetraloides heterodactyla.* The two species of *Tetraloides*, like *Tetralia*, are symbionts of *Acropora* in the Indo-west Pacific.

Tetraloides heterodactyla (Heller, 1861)

Tetralia heterodactyla Heller, 1861 : 14 (part).
Tetralia heterodactyla fusca Serène, 1959 : 153, fig. 5 C, 6 B (part). — 1984 : 283, pl. 42, fig. B (part).
Tetraloides nigrifrons – GALIL, 1986a : 72, figs 1-3 (part) ; 1987 : fig. 4 (?).
Tetraloides heterodactyla – GALIL, 1988b : 174, fig. 8 (part). — GALIL & CLARK, 1988 : 147, figs 1 D, 3 D, 4 D, 4 I, 6 D (full synonymy).

MATERIAL EXAMINED. — **Gemini Seamount.** GEMINI : st. PLG 54, 21°00.70'S, 170°03.20'E, 40 m, 5.7.1989 : 1 juvenile ♀ (MNHN-B 25183).

Solomon Islands. Peleni I. or Swallow I., Santa Cruz Is., 7.1926, coll. E. TROUGHTON & A. A. LIVINGSTONE : 1 ♂, 1 ♀ (AM P 9161).

Chesterfield Is. CORAIL 2 : st. DW 84, 19°12.0'S, 158°56.80'E, 16-26 m, 25.8.1988 : 1 ♀ (MNHN-B 25184). —

St. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 1 ♀ (MNHN-B 25185).

Western Indian Ocean. Material identified by R. SERÈNE as *Tetralia glaberrima* (Herbst) : Mombasa I., on *Acropora*, coll. A. J. BRUCE, 14.3.1972 : 1 ♂, 1 ♀ (MNHN-B 12798). — Material identified by R. SERÈNE as *Tetralia heterodactyla fusca* Serène & Dat, 1957 : Réunion, La Saline, on *Acropora humilis*, coll. S. RIBES, 4.1.1977 : 1 ♂, 1 ♀ (MNHN-B 8187).

COLOR. — No live specimens were collected during the course of this investigation. Preserved specimens have a light-brown carapace. A very thin red-brown line, followed by a thin, light-brown band, marks the anterior border. In one specimen, a few dark-brown spots, almost black, are scattered through the anterior portion. The posterior portion is of a slightly lighter brown. The carapace of a juvenile individual was light brown with irregular brown dots on its dorsal surface. Chelipeds are also light brown, with a few scattered dark-brown dots. The walking legs are light brown with dark-brown spots on the dorsal surface (see fig. 6 D *in* GALIL & CLARK, 1988). In the available specimens, these dark spots were in the form of aggregations of black granules.

This color pattern may be confused with that of preserved specimens of *Tetralia cinctipes*, particularly small ones. The brown spots on the chelipeds of *T. cinctipes*, however, are much darker and larger than those in *Tetraloides heterodactyla.*

REMARKS. — GALIL (1986a) originally included *T. heterodactyla* with *T. nigrifrons* as the only species in the genus but the two were eventually separated (GALIL & CLARK, 1988). *T. heterodactyla* was described by Heller (1861) from the Red Sea. Only part of the type material was found to belong to *T. heterodactyla* (GALIL, 1988a) before the species was divided so the existence of an actual holotype remains unclear.

Different color patterns and the presence of conspicuous triangular tubercles along the lower margin of the small cheliped distinguish *T. heterodactyla* from *T. nigrifrons*. *T. nigrifrons* is conspicuously dark brown with the central portion of the carapace cream in color. In addition, the anterior portion of the carapace of *T. heterodactyla* is relatively wider than its posterior portion when compared to *T. nigrifrons*. The anterior portion is also provided with more tubercles and setae than in *T. nigrifrons*.

T. heterodactyla has been recorded from the Red Sea, the western Indian Ocean, Christmas Island (GALIL & CLARK, 1988) and here for the first time from the Coral Sea. Its actual distribution across the Pacific Ocean remains unknown. At least some of the material from the Mariana Islands to French Polynesia that was first attributed to *T. nigrifrons* by GALIL (1986a) may actually represent *T. heterodactyla* (GALIL, 1988b).

Tetraloides nigrifrons (Dana, 1852)
Pl. 1 F

Tetralia nigrifrons Dana, 1852a : 83. — A. MILNE EDWARDS, 1873 : 272 (New Caledonia).
Tetralia heterodactyla forma *fusca* Patton, 1966 : 290 (Queensland, Australia).
Tetralia heterodactyla fusca Serène, 1984 : 283 (part).
Tetralia heterodactyla lissodactyla Serène, 1984 : 283, pl. 42, fig. C
Tetralia heterodactyla – TAKEDA & NUNOMURA, 1976 : 78 (New Caledonia, part). — JONES & MORGAN, 1994 : 178 (color photograph).
Tetraloides nigrifrons – GALIL, 1986a : 72 (part). — GALIL & CLARK, 1988 : 149, figs 1 E, 3 E, 4 E, 4 J, 5 B, 6 E (full synonymy). — PATTON, 1994 : 195 (Queensland, Australia).

MATERIAL EXAMINED. — **Chesterfield Is.** CORAIL 2 : st. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25186).

New Caledonia. Material identified by M. TAKEDA & N. NUNOMURA as *Tetralia glaberrima* (Herbst) : Ile des Pins, Melanesia Expedition, 6-13.11.1958 : 2 ♂, 3 ♀ (OMNH-Ar 1394-1398).

Vanuatu. 1 ♀ (BMNH 1896.1.2.54-7).

Niue I. BNIUE-365, Hikutavake, reef flat at church, *Acropora* and *Pocillopora*, 15.10.1991, coll. G. PAULAY : 1 ♀ (USNM 277638).

Western Indian Ocean. Material identified by R.SERÈNE as *Tetralia heterodactyla fusca* Serène & Dat, 1957 : Îles Glorieuses, intertidal zone, 9.1958, coll. A. CROSNIER : 3 ♂, 3 ♀ (MNHN-B 8204). — Intertidal zone, 9.1958, coll. A.

CROSNIER : 1 ♂ (MNHN-B 8184). La Réunion, on *Acropora*, 30.7.1977, coll. S. RIBES : 1 ♂, 1 ♀ (MNHN-B 13943). — Réunion, 4 m, on *Acropora*, coll. S. RIBES : 1 ♂, 1 ♀ (MNHN-B 13944). — Material identified by R. SERÈNE as *Tetralia heterodactyla lissodactyla* Serène & Dat, 1957 : Seychelles, Mahé, 10°08'S, 50°59'E, coll. A. J. BRUCE : 1 ♂, 1 ♀ (MNHN-B 8186). — Réunion, La Saline, 12.9.1977, coll. S. RIBES : 1 ♂, 1 ♀ (MNHN-B 8185). — Réunion, La Saline, 12.9.1977, coll. S. RIBES : 1 ♂, 1 ♀ (MNHN-B 8185). — Réunion, on *Acropora*, 24.8.1977, coll. S. RIBES : 1 ♂, 1 ♀ (MNHN-B 24924).

COLOR. — No live material was examined but the distinctive color pattern of the species keeps well in alcohol (pl. 1 F). The anterior and anterolateral edges of the carapace are dark brown, while the rest of the carapace is almost white (cream). The ventral surface is light brown with small dark-brown dots on the abdomen. The chelipeds are light brown. The large cheliped is ornamented with brown square reticulations along the inner and outer dorsal surface of its propodus. The walking legs are dark brown with large light-brown to cream spots on the dorsal surface. The dactylus and ventral surface are light brown.

A color photograph of a live specimen identified as *Tetralia heterodactyla* was given by JONES & MORGAN (1994). One of three color plates given by SAKAI (1976) as *Tetralia glaberrima* (pl. 183, fig. 1) most probably belongs to *T. nigrolineata*.

REMARKS. — *T. nigrifrons* can be morphologically distinguished from *T. heterodactyla* by the non-serrated ventral border of the propodus of the smaller cheliped, the narrower width of the anterior portion of the carapace in relation to the posterior portion, and the smaller number of tubercles and setae on the dorsal surface of the carapace.

T. nigrifrons has been reported from the western Indian Ocean and Christmas Island (GALIL & CLARK, 1988) and from locations across the Pacific Ocean (GALIL, 1986a). Records from the Pacific Ocean most probably include *T. heterodactyla* (GALIL, 1988b).

TRAPEZIA Latreille, 1828

The taxonomy of the estimated twenty-one known species of *Trapezia* has been a most perplexing one. Since color rather than morphology best distinguishes many species, much confusion and ambiguity has been created in efforts to identify material that lost its color during preservation. The importance of color eluded taxonomists who until recently considered these species, which can be defined by very small morphological features, as color varieties. A further complication is that the species of a particular region live sympatrically on their coral hosts and as a consequence they are collected together. Recent revisions of the taxonomy of *Trapezia* by CASTRO (1982, 1996), GALIL (1988b), and GALIL & LEWINSOHN (1984, 1985a, 1985b) have stressed the importance of color, even when small morphological differences can be used in their diagnosis.

Significant work has been undertaken on the ecology, behavior, and nutrition of *Trapezia*. Crabs depend on their host for food and shelter, and they have also been reported as defending corals from predation. Pocilloporid corals (*Pocillopora, Seriatopora*, and *Stylophora*) are the usual hosts. Reviews of work on the biology of *Trapezia* has been summarized by CASTRO (1976, 1988).

Trapezia cymodoce (Herbst, 1801)
Figs 2 A & 2 B, pls 2 A & 3 A

Cancer cymodoce Herbst, 1801 : 22, pl. 51, fig. 5.

Trapezia cymodoce – A. MILNE EDWARDS, 1873 : 260 (New Caledonia, part). — HASWELL, 1882 : 76 (Queensland, Australia). — CALMAN, 1900 : 20 (Queensland, Australia). — GRANT & MCCULLOUGH, 1906 : 118 (Queensland, Australia). — RATHBUN, 1923 : 129 (Queensland, Australia). — WARD, 1933 : 254 (Queensland, Australia). — MCNEILL, 1968 : 68 (Queensland, Australia). — PATTON, 1966 : 285 (Queensland, Australia) ; 1974 : 223, figs 1, 2 E (Queensland, Australia). — SAKAI, 1976 : 507, pl. 181, fig. 1 (color), pl. 184, fig. 1 (color photograph). — MIYAKE,

1983 : 139, pl. 47, fig. 1 (color photograph). — ABELE, 1984 : 128, 131 (Queensland, Australia). — ODINETZ, 1984 : 432, figs 1 C, 2 (part). — SERÈNE, 1984 : 272, fig. 179, pl. 38, fig. B (part). — GALIL, 1987 : fig. 2 ; 1988b : 161, fig. 1. — GALIL & CLARK, 1990 : 378 (New Caledonia ; full synonymy ; part). — DAVIE, 1993 : fig. 40-23 (Queensland, Australia). — TAKEDA, 1994 : 212, fig. 10 (color photograph). — PATTON, 1994 : 203 (Queensland, Australia).

Trapezia coerulea Rüppell, 1830 : 27, pl. 5, fig.7. — ODINETZ, 1984 : 438, figs 3 A, 3a, 4 A, 4a.

Trapezia dentata – A. MILNE EDWARDS, 1873 : 261 (New Caledonia).

Trapezia ferruginea – BOONE, 1934 : pl. 88

non *Trapezia cymodoce* – ODINETZ, 1983 : photograph 2 (color) ; = *Trapezia ferruginea* Latreille. — JONES & MORGAN, 1994 : 178 (color photograph) ; = *Trapezia lutea* sp. nov.

MATERIAL EXAMINED. — **New Caledonia**. St. B3, (T. P). dredgings, 22°17.60'S, 166°30.06'E, 15 m, 11.2.1985 : 1 ♂, 1 ♀ (MNHN-B 24925). — St. B6, T. P. dredgings, 22°18.15'S, 166°29.50'E, 15 m, 11.2.1985 : 1 ♂, 1 ♀ (MNHN-B 24926). — Saint Vincent Bay, 22°25'S, 166°50'E, dredging 2, 20.8.1985, coll. M. KULBICKI : 1 ♂ (MNHN-B 24927). — Saint Vincent Bay, 22°25'S, 166°50'E, dredging 4, 20.8.1985, coll. M. KULBICKI : 1 ♂ (MNHN-B 24928). — Renaurd I., 26.7.1986 : 1 ♂ (MNHN-B 24929). — 5-Milles Channel, 22°34'S, 166°05'E, 20-30 m, 6.11.1989 : 1 ♂ (MNHN-B 24930). — LAGON : various stations, 6-45 m, 5.1984-7.1985 : 91 ♂, 87 ♀ (MNHN-B 18195). — East lagoon : st. 625, 21°59.20'S, 166°53.60'E, 34-40m, 6.8.1986 : 3 ♂, 3 ♀ (MNHN-B 24931). — St. 671, 21°38.1'S, 166°25.50'E, 36-39 m, 8.8.1986 : 1 ♂ (MNHN-B 24932). — St. 702, 21°26.70'S, 166°08.20'E, 37 m, 10.8.1986 : 1 ♂, 2 ♀ (MNHN-B 24933). — St. 702, 21°26.70'S, 166°08.20'E, 37 m, 10.8.1986 : 1 ♂ (MNHN-B 24934, photographed). — St. 735, 22°05.10'S, 166°57.20'E, 15-34 m, 12.8.1986 : 2 ♂ (MNHN-B 24935). — North lagoon : dredging 74, 19°55'S, 161°24'E, 30 m, 6.12.1986, coll.P. LABOUTE, 1 ♀ (MNHN-B 924936, photographed). — St. 899, 20°14.20'S, 164°25.15'E, 16 m, 14.1.1987 : 1 ♂ (MNHN-B 24937). — North lagoon : st. DW 1088, 19°45.50'S, 163°57.70'E, 23 m, 24.10.1989 : 1 ♀ (MNHN-B 24938). — St. DW 1128, 19°31.20'S, 163°52.20'E, 26 m, 26.10.1989 : 3 ♂, 1 ♀ (MNHN-B 24939). — St. DW 1139, 19°23.60'S, 163°47.0'E, 39 m, 27.10.1989 : 1 ♀ (MNHN-B 24940). — St. DW 1156, 19°09.50'S, 163°12.60'E, 55 m, 30.10.1989 : 1 ♂ (MNHN-B 24941). — St. DW 1159, 19°13.0'S, 163.06.90'E, 50 m, 30.10.1989 : 1 ♂ (MNHN-B 24942). — St. DW 1189, 19°32.10'S, 163°34.20'E, 20 m, 1.11.1989 : 3 ♂, 2 ♀ (MNHN-B 24943). — St. DW 1190, 19°34.20'S, 163°30.80'E, 40 m, 1.11.1989 : 1 ♂, 1 ♀ (MNHN-B 24944). — Northwest lagoon : st. DW 1014, 20°08.70'S, 163°53.40'E, 22-23 m, 3.4.1988 : 1 ♂, 1 ♀ (MNHN-B 24945). — St. DW 1017, 20°07.50'S, 163°51.0'E, 21 m, 3.4.1988 : 1 ♂, 1 ♀ (MNHN-B 24946). — St. DW 916, 20°55.50'S, 164°28.30'E, 13 m, 26.4.1988 : 2 ♂, 2 ♀ (MNHN-B 24947). — St. DW 921, 20°51.20'S, 164°26.60'E, 10-11 m, 27.4.1988 : 2 ♀ (MNHN-B 24948). — St. DW 923, 20°48.70'S, 164°24.20'E, 9 m, 27.4.1988 : 1 ♂ (MNHN-B 24949). — St. DW 934, 20°43.0'S, 164°16.80'E, 10 m, 27.4.1988 : 1 ♂ (MNHN-B 24950). — St. DW 940, 20°38.10'S, 164°15.50'E, 10 m, 27.4.1988 : 1 ♂, 2 ♀ (MNHN-B 24951). — St. DW 955, 20°29.90'S, 164°05.0'E, 19 m, 28.4.1988 : 1 ♀ (MNHN-B 24952). — St. DW 957, 20°27.90'S, 164°08.60'E, 17-18 m, 28.4.1988 : 1 ♂ (MNHN-B 24953).— St. DW 958, 20°26.20'S, 164°07.40'E, 18-19 m, 28.4.1988 : 1 ♂ (MNHN-B 24954). — St. DW 959, 20°27.50'S, 164°05.50'E, 20 m, 28.4.1988 : 1 ♀ (MNHN-B 24955). — St. DW 960, 20°28.40'S, 164°03.60'E, 20 m, 28.4.1988 : 1 ♂, 1 ♀ (MNHN-B 24956). — St. CP 967, 20°21.60'S, 164°06.70'E, 12-16 m, 29.4.1988 : 1 ♀ (MNHN-B 24957). — St. DW 982, 20°22.0'S, 163°58.50'E, 34-48 m, 29.4.1988 : 1 ♂, 1 ♀ (MNHN-B 24958). — Southwest lagoon : coll. P. TIRARD : 1 ♂ (MNHN-B 24959). — EXPEDITION MONTROUZIER : Koumac barrier reef, between Infernet reef and land, 13 m, 5.10.1993 : 1 ♂, 1 ♀ (MNHN-B 24960). — Récif M'bere, pente externe, 25-30 m, 7.1.1993 : 1 ♂ (MNHN-B 25363). — Ilot Goeland, 10 m, 16.4.1993 : 1 ♂, 1 ♀ (MNHN-B 25370). — Récif Larégnère, 12-16 m, 3.5.1993 : 3 ♂, 3 ♀ (MNHN-B 25371).

New Caledonia. 1 ♀ (MNHN-B 2918). — St. 127, Maître I., 22°19.80'S, 166°25.10'E, 5 m, on *Pocillopora* spp., 24.4.1995, coll. P. CASTRO : 7 ♂, 4 ♀ (MNHN-B 24961), 1 ♂, 2 ♀ (USNM 277634). — St. 127, Maître I., 22°19.80'S, 166°25.10'E, 5 m, on *Pocillopora* spp., 24.4.1995, coll. P. CASTRO : 2 ♂, 2 ♀ (MNHN-B 24962, photographed). — St. 140, Sèche Croissant reef, 22°19.90'S, 166°22.30'E, 13 m, on *Pocillopora* spp., 26.4.1995, coll. P. CASTRO : 3 ♂, 5 ♀ (MNHN-B 24963). — St. 542, Larégnère reef, west side, 22°20.0'S, 166°14.80'E, 7 m, on *Acropora* sp., 26.4.1995, coll. P. CASTRO : 2 ♂, 2 ♀ (MNHN-B 24964, photographed). — St. 107, Boulari Pass, 22°29.90'S, 166°26.55'E, 10-20 m, on *Pocillopora* spp. and *Acropora* spp., 28.4.1995, coll. P. HAMEL : 2 ♂, 4 ♀ (MNHN-B 24965).

New Caledonia. Material identified by A. MILNE EDWARDS as *Trapezia dentata* (Macleay, 1838) : 5 ♂, 3 ♀ (MNHN-B 2919). — 3 ♂, 3 ♀ (MNHN-B 2920).

Loyalty Is. MUSORSTOM 6 : st. DW 431, Beautemps-Beaupré lagoon, 20°22.25'S, 166°10.0'E, 21 m, 18.2.1989 : 1 ♂, 1 ♀ (MNHN-B 24966). — St. DW 433, 20°20.24'S, 166°09.04'E, 24 m, 18.2.1989 : 1 ♀ (MNHN-B 24967). — St. DW 434, 20°21.21'S, 166°08.64'E, 23 m, 18.2.1989 : 1 ♀ (MNHN-B 25188). — PLOUVEAL : st. 1226, Ouvéa lagoon, 20°32.0'S,

166°24.0'E, 21 m, 9.9.1992, coll. R. LEBORGNE : 2 ♂, 3 ♀ (MNHN-B 24969). — St. 1222, Ouvéa lagoon, 20°28.0'S, 166°30.0'E, 15 m, 12.9.1992, coll. R. LEBORGNE : 2 ♂, 3 ♀ (MNHN-B 24968). — St. 1228, Ouvéa lagoon, 20°36.0'S, 166°24.0'E, 18 m, 15.9.1992, coll. R. LEBORGNE : 1 ♀ (MNHN-B 24970). — St. 1229, Ouvéa lagoon, 20°37.10'S, 166°22.90'E, 16 m, 15.9.1992, coll. R. LEBORGNE : 1 ♂, 1 ♀ (MNHN-B 24971). — St. 1230, Ouvéa lagoon, 20°35.0'S, 166°22.90'E, 18 m, 15.9.1992, coll. R. LEBORGNE : 2 ♂, 1 ♀ (MNHN-B 24972). — Ouvéa lagoon : 1 ♂ (MNHN-B 24973).

Vanuatu. Port Patterson : 1 ♂, 1 ♀ (BMNH 1896.1.2.21-23).

Chesterfield Is. CHALCAL 1 : st. D 34, 19°52.10'S, 158°20.10'E, 33-37 m, 21.7.1984 : 2 ♂, 3 ♀ (MNHN-B 24974). — CORAIL 2 : st. DW 11, 20°50.19'S, 161°40.56'E, 58 m, 20.7.1988 : 1 ♀ (MNHN-B 24975). — St. DW 12, 20°47.74'S, 161°36.32'E, 59 m, 20.7.1988 : 1 ♀ (MNHN-B 24976). — St. DW 46, 19°18.54'S, 158°20.0'E, 21 m, 23.7.1988 : 1 ♂, 3 ♀ (MNHN-B 24977). — St. DW 70, 19°15.0'S, 158°26.60'E, 54 m, 25.8.1988 : 1 ♀ (MNHN-B 24978). — St. DW 84, 19°12.0'S, 158°56.80'E, 16-26 m, 25.8.1988 : 3 ♂, 2 ♀ (MNHN-B 24979). — St. DW 88, 19°05.98'S, 158°55.85'E, 32 m, 26.8.1988 : 3 ♂, 2 ♀ (MNHN-B 24980). — St. DW 89, 19°03.02'S, 158°57.83'E, 40 m, 26.8.1988 : 1 ♂ (MNHN-B 24981). — St. CP 90, 19°02.83'S, 158°56.26'E, 44-48 m, 26.8.1988 : 2 ♂, 1 ♀ (MNHN-B 24982). — St. DW 94, 19°06.0'S, 158°50.0'E, 36-56 m, 27.8.1988 : 2 ♂, 1 ♀ (MNHN-B 24983). — St. DW 97, 19°06.0'S, 158°38.43'E, 32 m, 27.8.1988 : 2 ♀ (MNHN-B 24984). — St. DW 101, 19°08.99'S, 158°26.24'E, 37 m, 27.8.1988 : 1 ♂, 1 ♀ (MNHN-B 24985). — St.104, 19°08.95'S, 158°35.67'E, 49 m, 27.8.1988 : 1 ♂ (MNHN-B 24986). — St. DW 105, 19°08.91'S, 158°39.19'E, 35 m, 27.8.1988 : 1 ♂, 1 ♀ (MNHN-B 24987). — St. DW 115, 19°22.01'S, 158°37.62'E, 44 m, 28.8.1988 : 1 ♂, 2 ♀ (MNHN-B 24988). — St. DW 126, 19°28.07'S, 158°27.0'E, 46 m, 29.8.1988 : 1 ♂, 1 ♀ (MNHN-B 24989). — St. DW 127, 19°27.73'S, 158°27.30'E, 44-45 m, 29.8.1988 : 3 ♂, 2 ♀ (MNHN-B 24990). — St. DW 132, 19°31.0'S, 158°28.64'E, 38-50 m, 30.8.1988 : 1 ♀ (MNHN-B 24991). — St. DW 136, 19°31.28'S, 158°16.0'E, 37 m, 30.8.1988 : 1 ♀ (MNHN-B 24992). — St. DW 137, 19°34.0'S, 158°14.60'E, 32 m, 30.8.1988 : 1 ♂ 1 ♀ (MNHN-B 24993). — St. DW 138, 19°33.85'S, 158°17.57'E, 31 m, 30.8.1988 : 2 ♂ (MNHN-B 24994). — St. DW 151, 19°54.0'S, 158°23.0'E, 35 m, 1.9.1988 : 1 ♂ (MNHN-B 24995). — St. 155, 19°49.08'S, 158°24.85'E, 42 m, 1.9.1988 : 1 ♀ (MNHN-B 24996). — St. DW 159, 19°46.04'S, 158°19.98'E, 52 m, 1.9.1988 : 1 ♂ (MNHN-B 24997). — St. DW 163, 19°41.46'S , 158°15.62'E, 23 m, 2.9.1988 : 1 ♀ (MNHN-B 24998). — St. DW 165, 19°41.41'S, 158°21.85'E, 45 m, 2.9.1988 : 1 ♂, 1 ♀ (MNHN-B 24999).

Bellona Reefs. St. 11 DE, 21°51.0'S, 159°32.0'E, 27-30 m, 22.10.1985 : 1 ♂ (MNHN-B 25000).

Queensland, Australia. Low Is., Great Barrier Reef Expedition, 13.2.1928 : 1 ♀ (BMNH 1937.9.21.170-179). — Low Is., Great Barrier Reef Expedition, 1929 : 8 ♂, 7 ♀ (BMNH 1937.9.21.170-179). — St. 10, Satellite Reef, Great Barrier Reef Expedition, 22.2.1929 : 1 ♂, 1 ♀ (BMNH 1937.9.21.170-179). — St. 23, Turtle Is., Great Barrier Reef Expedition, 12.3.1929 : 1 ♀ (BMNH 1937.9.21.170-179). — Great Barrier Reef Expedition, 1928-29 : 2 ♂, 2 ♀ (BMNH 1937.9.21.170-179). — Thomas Cay, 11.1960, coll. L. R. THOMAS : 2 ♂, 2 ♀ (AM P16989). — Gillet Cay, 10.1962, 21°43'S, 152°25'E, Swain Reefs Expedition : 1 ♀ (AM P17212). — Swain Reefs, 15.9.1974, coll. N. COLEMAN : 1 ♀ (AM P89693). — Cook I., 8.1985, coll. J. JOHNSON & J. SHORT : 1 ♂, 1 ♀ (QM W11938). — Seaforth I., 24.3.1987, coll. P. DAVIE & J. SHORT : 6 ♂, 2 ♀ (QM W14395). — Home Beach, Lindeman I., 25.3.1987, coll. P. DAVIE & J. SHORT : 1 ♂, 1 ♀ (QM W14450). — Mudjimba I., 26°36.80'S, 153°06.80'E, 5 m, 9.2.1994, coll. J. SHORT : 2 ♂, 3 ♀ (QM W19851). — Reef 1 km south west of Research Point, Lizard Island, 14°40'S, 145°28'E, 3 m, on *Pocillopora* sp., 8.6.1995, coll. P. CASTRO & R. SPRINGTHORPE : 2 ♀ (AM P44625, photographed). — Reef 1 km south west of Research Point, Lizard Island, 14°40'S, 145°28'E, 3 m, on *Pocillopora* sp., 9.6.1995, coll. P. CASTRO & R. SPRINGTHORPE : 1 ♂, 1 ♀ (AM P44622, photographed).

Middleton Reef. Lagoon, 29°27.1'S, 159°06.8'E, 7.12.1987, coll. J. LOWRY : 3 ♂, 2 ♀ (AM P38233).

Elizabeth Reef. Reef flat, 29°55.8'S, 159°01.3'E, 14.12.1987, coll. J. LOWRY : 6 ♂, 2 ♀ (AM P38234).

Western Australia. Shore reef, 14 milles north of Pellortes, 8.9.1968, Mingaloo Expedition : 1 ♂, 2 ♀ (WAM 514-86). — Monkey Rock, Shark Bay, 11.3.1986 : 2 ♂, 2 ♀ (WAM 169-90). — Kendrew I., Dampier Archipelago, 20.5.1974, Crown-of-Thorns Survey : 4 ♂, 5 ♀ (WAM 504-86). — Condillac I., Kimberley Is., 10 m., 16.7.1988 : 2 ♂, 3 ♀ (WAM 998-88).

Belau (Palau). Bebelthuap I., 3 m, on *Pocillopora cespitosa*, 29.6.1974, coll. P. CASTRO : 4 ♂, 5 ♀ (MNHN-B 22942).

COLOR. — The dorsal surface of the carapace of live individuals has a color perhaps best described as purplish blue (pl. 2 A). The intensity of the color varies, however, sometimes taking a brownish blue or, rarely, turning into light violet. Two transversal rows of orange-red dots (usually eight on each side) radiate

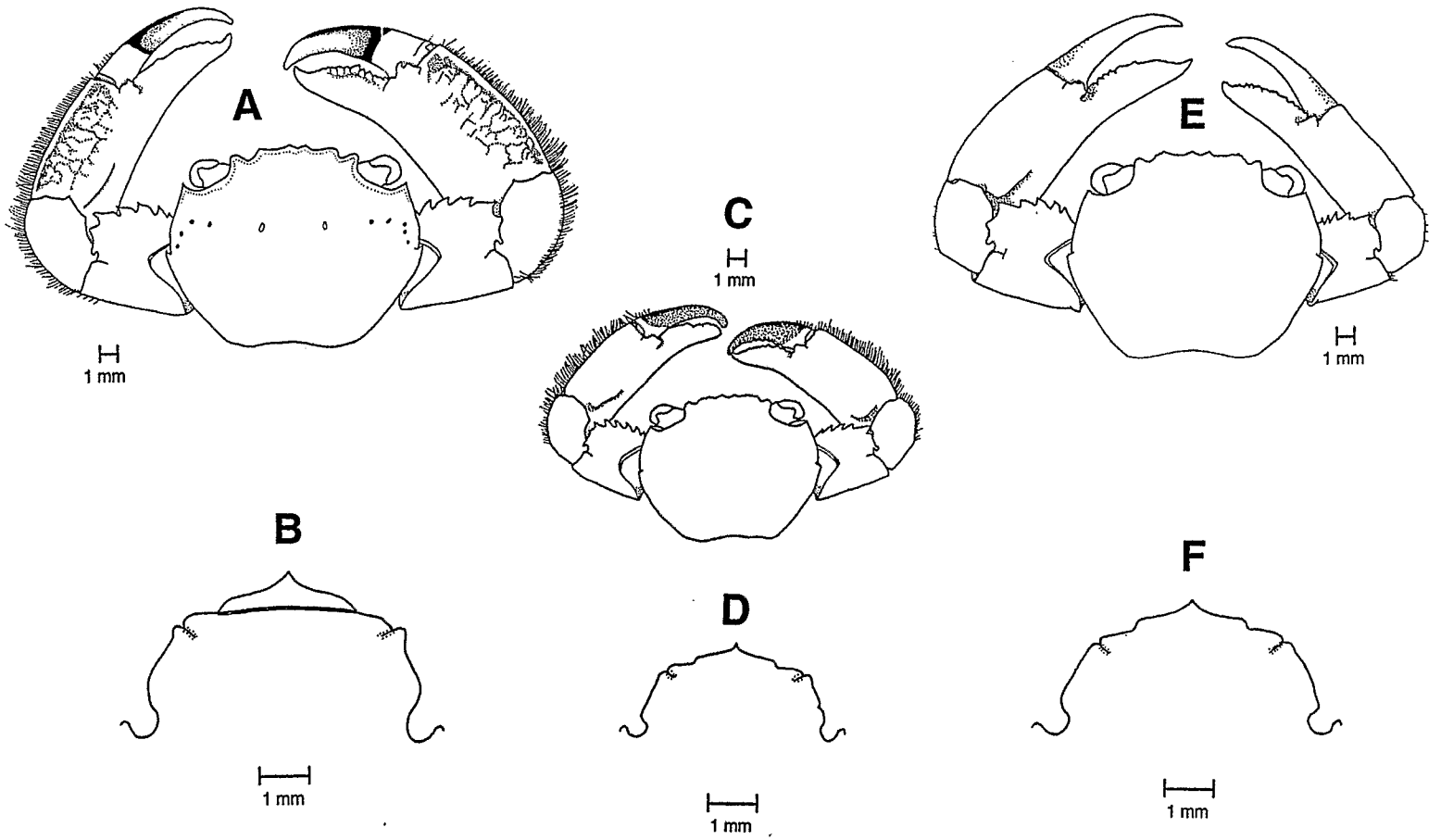

Fig. 2. — *Trapezia cymodoce* (Herbst, 1801), New Caledonia, ♀ (MNHN-B 24961) : **A.** dorsal aspect of the carapace, **B.** anterior sternal region ; *Trapezia lutea* sp. nov., ♀ paratype, Chesterfield Is. (MNHN-B 25223) : **C.** dorsal aspect of the carapace, **D.** anterior sternal region ; *Trapezia ferruginea* Latreille, 1828, Chesterfield Is., ♀ (MNHN-B 25004) : **E.** dorsal aspect of the carapace, **F** anterior sternal region.

symmetrically across the upper half of the carapace from two (sometimes one) larger dots on the center of the gastric region, curving downwards to just above the epibranchial teeth. The anterior edge of the carapace is ornamented with a thin, red or red-orange line, particularly between the eyes. The base of the epibranchial teeth is often red. Chelipeds are orange, often with a thin red-orange and pink line along the edges ; red-orange square reticulations are usually found on the upper surface of the propodus. The dactylus has a dark-brown band that reaches distally to only about two-thirds of its total length. The tomentum of the chelipeds is typically colorless but the presence of filamentous cyanobacteria can give it a greenish or greenish brown color. In one specimen the base of the setae was colorless but the outer half was bright orange. Ventrally, the body is orange ; the anterior portion of the carapace is blue-violet with two longitudinal red-orange lines and a light-violet band below.The eyes are black.

In preserved specimens, the dorsal surface of the carapace, particularly the anterior portion, typically remains brownish in contrast with the orange of the rest of the body. The dots, particularly the two large central ones, may remain visible after many decades of preservation, even in dry specimens.

Color photographs of *T. cymodoce* were given by SAKAI (1976), MIYAKE (1983), and TAKEDA (1986, 1994).

REMARKS. — The separation between *T. cymodoce* and *T. ferruginea*, another species characterized by its large size, has been much debated. Both species have been recorded as sympatric through most of the Indo-west Pacific. *T. cymodoce*, however, is absent from the eastern Pacific (CASTRO, 1996).

Descriptions of the two species were too brief and the type specimen of *T. cymodoce*, like that of *T. ferruginea*, was "displaced or destroyed" (H. E. GRUNER, *in litt.*, June 6, 1994). A photograph of the type of *T. cymodoce* in RATHBUN (1906 ; pl. 11, fig. 6), however, shows features characteristic of the species : almost parallel anterolateral borders, a pointed tooth on the carpus of right cheliped, and epibranchial teeth that are spine-like, acute, and pointed upwards. The illustration given in the description (HERBST, 1801) also shows these features. Disagreements as to the validity of the characters used to separate the two species, however, led to misidentifications and to the description of separate species and varieties, even when DE MAN (1880) clearly outlined the differences between the two species (also see ALCOCK, 1898, BOONE, 1934, GALIL & CLARK, 1990). ORTMANN (1893) relegated *T. ferruginea* to a variety of *T. cymodoce* but treated them as separate species in a subsequent review (ORTMANN, 1897). RATHBUN (1907, 1930) reduced *T. ferruginea* to subspecies status under *T. cymodoce*.

Examination of numerous Indo-west Pacific specimens previously identified as *T. ferruginea* or *T. cymodoce*, as well as live material, confirmed that in addition to color, several morphological characters separate the two species. *T. cymodoce* is characterized by : **1)** a carapace that is purplish blue and ornamented with a transversal row of orange-red spots (fig. 2 A, pls 2 A & 3 A) that remain in preserved specimens (it is uniformly orange to brownish orange in *T. ferruginea*), **2)** a well developed tomentum (fig. 2 A, pls 2 A & 3 A) that consists of numerous plumose setae is always present along the entire upper and outer surface of the chelipeds (few microscopic setae or, sometimes, a conspicuous tomentum that is restricted to the cheliped carpus in *T. ferruginea* (fig. 3 E), **3)** a keeled, subacute upper edge of the cheliped propodus (rounded in fully grown *T. ferruginea*), **4)** the dark portion of the dactylus extends distally to only about two-thirds of the length of the dactylus (fig. 2 A) (it extends almost to the base in *T. ferruginea* ; see fig 3.A *in* CASTRO, 1996), **5)** a conspicuous suture between the second and third thoracic sternites that is always present (fig. 2 B), sometimes marked by a thin, dark-orange line in the largest individuals (fused suture in adult *T. ferruginea* ; fig. 2 F), **6)** acute tooth on the distal margin of the cheliped carpus (fig. 2 A) except in most of the largest specimens (rounded, blunt tooth in juvenile and adult *T. ferruginea* ; fig. 2 E), **7)** the epibranchial teeth of the carapace are acute, taking the shape of a spine (fig. 2 A), and slightly more posterior (obtuse and slightly more anterior in fully grown *T. ferruginea* ; fig. 2 E ; also see figs 26 & 27 *in* SERÈNE, 1971), **8)** the anterolateral borders of the carapace are almost parallel to each other at the base (fig. 2 A, pls 2 A & 3 A), although anteriorly more curved in the largest specimens (incurved or convex, except in juveniles, in *T. ferruginea* ; fig. 2 E), **9)** the inner suborbital teeth are long and acute, particularly in small individuals, so that they clearly reach the full extension of the supraorbital angles of the carapace (shorter and subacute in *T. ferruginea*, barely reaching the length of the supraorbital angles), **10)** six to eight transversal rows of setae on the inner margin of the last walking leg (five to six in *T. ferruginea*), **11)** the apex of the first male

pleopod is wider (more slender in *T. ferruginea* ; see figs 30-33 *in* SERÈNE, 1971 and figs 179 & 180 *in* SERÈNE, 1984), and **12**) the merus of the fourth pair of walking legs is slightly longer, with a total length to maximum width ratio of 2.4 to 2.5 (shorter in *T. ferruginea*, with a length to width ratio of 2.1 to 2.2). Differences in color and morphology are summarized in table 1.

Table. 1. — Summary of diagnostic characters of *Trapezia cymodoce*, *T. lutea*, and *T. ferruginea.*

Diagnostic characters	***Trapezia cymodoce***	***Trapezia lutea***	***Trapezia ferruginea***
color of carapace	bluish purple with two rows of orange-red spots	orange to yellow-orange	orange to brown-orange
color of dactylus	distally dark 2/3 of length	dark almost from the base	dark almost from the base
tomentum on cheliped propodus	present	present	absent or much reduced
cheliped propodus	subacute	subacute	rounded
thoracic suture 2/3	present	present only in smaller individuals	present only in juveniles
tooth on cheliped carpus	usually acute	blunt	blunt
epibranchial teeth	acute	obtuse in larger individuals	obtuse
anterolateral borders of carapace	usually parallel	rounded	rounded
inner suborbital teeth	longer and acute	shorter and subacute	shorter and subacute
rows of setae on 4th walking leg	6-8	4-5	5-6
merus of 4th walking leg	longer	shorter	shorter

Of all the diagnostic characters, color pattern, the development of tomentum on the chelipeds, and the presence of a suture between the second and third thoracic sternites (found in all 381 Coral Sea and Western Australia specimens studied) are the most reliable in separating fully grown individuals of *T. cymodoce* from *T. ferruginea.* Color and the presence of an acute tooth on the cheliped carpus are most useful in juveniles and small adults.

The same identical color pattern of *T. cymodoce* was described by ODINETZ (1984) in her reinstatement of *T. coerulea* Rüppell as a separate species. This has been the source of considerable confusion. *T. cymodoce* was referred to by ODINETZ (1983, 1984) as *T. coerulea*, while material belonging to *T. ferruginea* and possibly *T. lutea* sp. nov., were identified as *T. cymodoce.* The examination of Rüppell's type material by GALIL (1988 b), however, showed that *T. coerulea* is a junior synonym of *T. cymodoce* (GALIL & CLARK, 1990). The description of the distinctive "orange variety" of *T. cymodoce* as a separate species (*T. lutea* sp. nov.) should clarify this problem.

A. MILNE EDWARDS (1873) identified specimens of *T. cymodoce* from New Caledonia (MNHN-B 2919 & 2920) as *T. dentata* (Macleay). It was described as the most common species in New Caledonia. Specimens were light brown (*brun clair*), with acute lateral teeth and short pubescence on the chelipeds. Examination of these specimens confirms the conclusion of GALIL and CLARK (1990) that this material actually represents *T. cymodoce.* Traces of the color spots on the dorsal surface of the carapace that are characteristic of *T. cymodoce* can still be seen on a few of the dried specimens.

T. cymodoce was the most common species of *Trapezia* in the New Caledonia and Australia coral reefs that were sampled. Although it primarily inhabits colonies of *Pocillopora*, it was occasionally found in *Acropora* (PATTON, 1994).

T. cymodoce is known throughout the Indo-west Pacific region, including Japan and perhaps French Polynesia but excluding the Hawaiian Islands (GALIL & CLARK, 1990). Many of these records, however, are questionable.

Trapezia digitalis Latreille, 1828
Pl. 3 B

Trapezia digitalis Latreille, 1828 : 696. — WARD, 1933 : 254 (Queensland, Australia). — SERÈNE, 1959 : 129, figs 1, 2 A, pl. 1. — PATTON, 1966 : 286 (Queensland, Australia). — SAKAI, 1976 : 510, pl. 182, fig. 3 (color). — SERÈNE, 1984 :

277, fig. 185, pl. 38, fig. D. — GALIL, 1988b : 163, fig. 2. — CASTRO, 1996 : 536, fig. 2.

MATERIAL EXAMINED. — **Chesterfield Is.** CORAIL 2 : st. DW 84, 19°12.0'S, 158°56.80'E, 16-26 m, 25.8.1988 : 4 ♂, 4 ♀ (MNHN-B 25001). — St. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 4 ♂, 4 ♀ (MNHN-B 25002).

Flinders Reefs. 26°59'S, 159°29'E, 6-20 m, 10.3.1989, coll. P. DAVIE, J. SHORT & P. LAWLESS : 3 ♂, 4 ♀ (QM W16227).

Queensland, Australia. Shag Rock, off Stradbroke I., 27°25'S, 153°31'E, 15 m, on *Pocillopora* sp., 5.2.1992, coll. J. SHORT : 1 ♂, 1 ♀ (QM W19404).

Elizabeth Reef. Lagoon, 4.5.1987, coll. J. SHORT : 1 ♂ (QM W12977).

COLOR. — The carapace and dorsal surface of the chelipeds are of a dark-brown color unique in *Trapezia* (pl. 3 B). A thin, light-brown line is usually found along the anterior border of the carapace and cheliped merus. The ventral portion of the cheliped propodus and fingers are light brown or dark orange-white (cream), with an orange-white, node-like tubercle at the base of the dactylus. The dorsal portion of the cheliped propodus is typically ornamented with square and rectangular reticulations that are light brown in color. Walking legs are light to reddish brown. Postlarvae and juveniles often have a broad orange-white band across the posterior portion of the carapace. The live color pattern remains remarkably well preserved in alcohol.

A color photograph of *T. digitalis* was given by NAGAI & NOMURA (1988).

REMARKS. — *T. digitalis* can be easily identified by its dark-brown color, small size, and by a carapace with a frontal border that has minute teeth and very slight emarginations. The anterolateral borders of the carapace are always parallel to each other. The acute epibranchial teeth of small individuals are reduced to a notch and eventually disappear in the largest individuals. The posterolateral borders of the carapace converge posteriorly more abruptly than in the other species of *Trapezia* very much as in *Tetraloides nigrifrons*, which also has a dark-brown color. A suture between the second and third thoracic somites is found only in juveniles and small adults.

T. digitalis is one of the most widely distributed species of *Trapezia*. It has been recorded throughout the Indo-west Pacific and eastern Pacific regions (SERÈNE, 1984). No significant morphological differences were found among specimens collected in the Indian Ocean and the west coast of North and South America (CASTRO, 1996).

Trapezia ferruginea Latreille, 1828
Figs 2 E & 2 F

Trapezia ferruginea Latreille, 1828 : 695. — SAKAI, 1976 : 507, pl. 182, fig. 2 (color). — SERÈNE, 1984 : 273, fig. 180, pl. 38, fig. C. — GALIL, 1987 : fig. 1 ; 1988b : 164, fig. 3 (full synonymy). — CASTRO, 1996 : 539, fig. 3.

Trapezia cymodoce – A. MILNE EDWARDS, 1873 : 260 (New Caledonia, part). — ODINETZ, 1983 : 30, 85, 87, 96, 107, 114, 134, 205, 211, 216, photograph no. 2 (part ; color). — ODINETZ, 1984 : 432, figs 1 A, 1 B, 2 (part).

non *Trapezia ferruginea* – JONES & MORGAN, 1994 : 178 ; = *Trapezia serenei* Odinetz.

MATERIAL EXAMINED. — **New Caledonia.** Material identified by A. MILNE EDWARDS as *Trapezia cymodoce* (Herbst, 1801) : 2 ♂, 1 ♀ (MNHN-B 2918).

Gemini Seamount. GEMINI : st. PLG 62, 21°00.7'S, 170°03.20'E, 40 m, 6.7.1989 : 1 ♀ (MNHN-B 25003).

Chesterfield Is. CORAIL 2 : st. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 1 ♂, 6 ♀ (MNHN-B 25004).

Guam. Material collected and identified by O. ODINETZ as *Trapezia cymodoce* aff. *ferruginea* : on *Pocillopora* sp., 3.1981 : 1 ♂, 1 ♀ (MNHN-B 9676). — On *Pocillopora* sp., 3.1981 : 1 ♂, 1 ♀ (MNHN-B 9677). — On *Pocillopora* sp., 6.1981 : 1 ♂, 1 ♀ (MNHN-B 9678).

COLOR. — No live Indo-west Pacific specimens were examined during the course of this investigation. In the eastern Pacific populations the carapace and chelipeds are orange to brownish orange, with anterior border of the carapace and merus of chelipeds slightly lighter in color (CASTRO, 1996).

Preserved Indo-west Pacific specimens are uniformly orange. The anterior borders of the carapace and the merus and carpus of the chelipeds are darker orange. A diagnostic feature is the orange-red spot on the distal end

of the propodus of the walking legs. It has remained in specimens preserved for over fifteen years.

Color differences have been recorded for *T. ferruginea* throughout its range : "bright orange red, with brownish black eyes and wood brown fingers" in live specimens from French Polynesia and Bali (BOONE, 1934), "uniformly yellowish or light brownish" from southern Japan but illustrated in a plate as light orange-brown with darker reticulations on the chelipeds (SAKAI, 1976), "yellowish bluish-grey" carapace and walking legs "ocher-yellow with red dot distally on propod" in live specimens from the Red Sea (GALIL, 1988b), "uniform orange yellow" in the western Indian Ocean (SERÈNE, 1984), and "yellowish" with brown carapace borders and cheliped joints in a preserved specimen from the South China Sea (DAI & YANG, 1991). It is possible, however, that some of these records were the result of erroneous identifications. The two specimens in a photograph in BOONE (1934) most probably represent *T. cymodoce*.

REMARKS. — Morphological similarities between *T. ferruginea* and *T. cymodoce* have been the source of much confusion (see discussion of *T. cymodoce*). Individuals of both species reach a large size and are found throughout the Indo-west Pacific region. *T. ferruginea* is also found in the eastern Pacific (CASTRO, 1996). The two species are best differentiated by color : carapace of a uniform color in *T. ferruginea* but with two transversal rows of orange-red dots only in *T. cymodoce* (fig. 2 A, pls 2 A & 3 A).

The most reliable morphological diagnostic features of *T. ferruginea* are the absence of a conspicuous tomentum along the outer margin of the cheliped (in contrast to *T. cymodoce* and *T. lutea* sp. nov.) and the absence of a suture between the second and third thoracic somites (fig. 2 F). This suture is always present in *T. cymodoce* but it may be absent in the larger specimens of *T. lutea* and *T. serenei*, both of which reach a size comparable to that of medium-size *T. ferruginea*. The upper edge of the cheliped propodus is rounded, the distal margin of the cheliped carpus is marked by a rounded tooth (fig. 2 E), even in juveniles, the epibranchial teeth are always obtuse in adults (fig. 2 E), the anterolateral borders of the carapace are convex in adults (fig. 2 E), there are five to six transversal rows of setae on the last pair of walking legs (fig. 1 *in* GALIL, 1987), and the first male pleopod is slender (figs 31 & 33 *in* SERÈNE, 1971, fig. 180 *in* SERÈNE, 1984, and figs 3 D & 3 E *in* CASTRO, 1996). Table 1 summarizes differences between *T. ferruginea*, *T. cymodoce*, and *T. lutea*.

The development of tomentum varies in *T. ferruginea*, which explains in part some of the "intermediate" individuals of ODINETZ (1984). In most specimens it consists of microscopic setae restricted to the carpus and the proximal portion of the propodus. A conspicuous tomentum restricted to the joints of the carpus have been found in a few eastern Pacific specimens (CASTRO, 1996). In one individual the conspicuous tomentum was present in only one cheliped.

Variations in some of the characters traditionally used in the diagnosis of *T. ferruginea* and *T. cymodoce*, a claim that some of morphological differences previously used were not valid, and the finding of seemingly intermediate specimens from Guam and French Polynesia led ODINETZ (1984) to erroneously consider *T. ferruginea* a junior synonym of *T. cymodoce*.

Three of four dry specimens from New Caledonia identified by A. MILNE EDWARDS (1873) as *T. cymodoce* (MNHN-B 2918) and described as having a uniform yellowish color and lateral teeth that were *obtuse et peu visibles*, were found to be *T. ferruginea*. These specimens also have a complete ventral sternum, slightly curved anterolateral sides, and a rounded tooth on the distal margin of the cheliped carpus.

Together with *T. digitalis*, *T. ferruginea* is the most widely distributed species of *Trapezia*. It has been recorded across the Indo-west Pacific region (including the Hawaiian Islands and Easter Island) and the eastern Pacific (GARTH, 1973 ; SERÈNE, 1984 ; HUBER & COLES, 1986). Closer examination of live color and morphological characters, however, may demonstrate the existence of more than one species.

Trapezia flavopunctata Eydoux & Souleyet, 1842

Trapezia flavopunctata Eydoux & Souleyet, 1842 : 230, pl. 2, fig. 3. — SAKAI, 1976 : 510, pl. 182, fig. 4 (color). — SERÈNE, 1984 : 276, fig. 183, pl. 42, fig. A. — GALIL & LEWINSOHN, 1985a : 210 (full synonymy).
Trapezia latifrons A. Milne Edwards, 1867 : 281 ; 1873 : 259, pl. 10, fig. 7 (New Caledonia).

MATERIAL EXAMINED. — **New Caledonia.** coll. M. BALANSA : 1 ♂ (MNHN-B 2954).

COLOR. — GALIL & LEWINSOHN (1985a) described the color pattern of the species as "reticulated pattern of red lines circumscribing large yellow spots". A color photograph was given by NAGAI & NOMURA (1988) and a color figure by SAKAI (1976).

REMARKS. — Although not collected during this investigation, a dried specimen from New Caledonia (MNHN-B 2954) identified as *Trapezia latifrons* A. Milne Edwards clearly shows the morphological features that characterize *T. flavopunctata*. As in *T. rufopunctata*, the inner margin of the cheliped propodus is armed with two rows of thick tubercles that give the appearance of a serrated border. In contrast, the frontal teeth are rounded, not acute as in *T. rufopunctata* (GALIL & LEWINSOHN, 1985a). Individuals of both of these species reach the largest size among all species of *Trapezia*.

T. flavopunctata is known from numerous locations in the Indo-west Pacific region, including the Hawaiian Islands and French Polynesia (see SERÈNE, 1984, GALIL & LEWINSOHN, 1985a, and HUBER & COLES, 1986), but apparently excluding the Red Sea.

Trapezia formosa Smith, 1869

Trapezia formosa Smith, 1869 : 286. — CASTRO, 1982 : 12 ; 1996 : 544 , fig. 4 (full synonymy).

MATERIAL EXAMINED. — **Chesterfield Is.** CORAIL 2 : st. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 4 ♂, 4 ♀ (MNHN-B 25191).

COLOR. — Preserved specimens from the Coral Sea are uniformly orange with the borders of the carapace and segments of the chelipeds and walking legs a slightly darker orange. There is no evidence of any distinctive color dots, spots, lines, or bands on the carapace and chelipeds. Most specimens, however, show irregular and faint orange reticulations on the walking legs. No live specimens, however, were examined.

Live *T. formosa* from the eastern Pacific are bright reddish orange, with the inner surface of the cheliped propodus reddish orange dorsally and orange-yellow ventrally ; dark-orange reticulations are often present on the inner surface of the cheliped propodus (CASTRO, 1982 ; 1996).

REMARKS. — There are no morphological differences between the specimens from the present collection and *T. formosa*, which has been presumed to be endemic to the eastern Pacific (CASTRO, 1982 ; 1996). All available specimens are of a homogeneous small size. The carapace width of the four males vary between 6.5 mm and 7.0 mm, carapace length between 5.0 mm and 5.5 mm ; the four females have a carapace width of 6.8 mm to 8.5 mm and a carapace length of 5.0 mm to 6.5 mm. All females were ovigerous, which precludes the possibility that the Chesterfield Islands specimens represent the immature or juvenile stage of a large-size species. As in *T. formosa*, the anterolateral borders of the carapace are curved, the anterior border is divided into two rounded supraorbital angles and four lobes, the epibranchial teeth are reduced to slight notches or absent (particularly in the larger females), there is no suture between the second and third thoracic sternites, the chelipeds are thick with short fingers, the last pair of walking legs has three transversal rows of setae, and the first pair of male pleopods is relatively short with a stout, symmetrical apex.

Several records of *T. formosa* in the Indo-west Pacific region may have been erroneous identifications that resulted from the use of a key by SERÈNE (1971) (CASTRO, 1996). Specimens from the South China Sea identified as *T. formosa* (DAI *et al.*, 1983, 1986 ; DAI & YANG, 1991) seems such a case. The anterior border of the carapace is only divided into two lobes, in contrast to four in *T. formosa*. Preserved specimens were orange ("orange-red" *in* DAI *et al.*, 1983) with a dark "meshwork pattern" on chelipeds and legs.

The French Polynesia specimens identified by ODINETZ (1983) as *T. formosa* is being described as a new species (CASTRO, 1997).

T. formosa is close to several other species characterized by their small size, globose appearance, reduced or absent epibranchial teeth, and thick chelipeds. These species can be best differentiated by their color pattern.

One such small-size species is *T. cheni* Galil, which was described from Taiwan. Its carapace is orange-yellow

with anterior and lateral portions brownish red (GALIL, 1983). The chelipeds are deep red, with a white tubercle on the upper proximal portion of the dactylus. There is no tooth or notch on the sides of the carapace and the distal end of the cheliped carpus has only one tooth. The carapace of *T. garthi* Galil, also from Taiwan, has "irregular rounded areolae enclosed in thick net of magenta" on the dorsal surface of the carapace (GALIL, 1983).

T. bella Dana and *T. speciosa* Dana, known from several locations in the Indo-west Pacific, also have a small, rounded carapace. The carapace, chelipeds, and walking legs, however, have many small red dots in the case of *T. bella* and a network of irregular red-brown lines in *T. speciosa* (CASTRO, 1997). The color patterns of these species, which can be discerned in preserved specimens, is absent in the uniform orange color of the preserved *T. formosa* from this collection.

T. formosa has also been reported from Enewetak, Marshall Islands (HUBER, 1985) and Taiwan (CHANG *et al.*, 1987). Enewetak populations, however, were shown to be genetically different from those in the eastern Pacific.

Although collected at only one station in the Chesterfield Islands, *T. formosa* may be more common elsewhere. It may have been overlooked due to its small size or assumed to be young individuals of another species. In the eastern Pacific *T. formosa* inhabits areas deep in coral colonies, very small colonies, and live coral fragments (CASTRO, 1996).

Trapezia guttata Rüppell, 1830
Pls 2 B & 4

Trapezia guttata Rüppell, 1830 : 27. — FOREST & GUINOT, 1961 : 136, figs 134, 139 a, b. — SAKAI, 1976 : 508, fig. 270, pl.183, fig. 3 (color). — MIYAKE, 1983 : 139, pl. 47, fig. 2 (color photograph). — SERÈNE, 1984 : 271, fig. 178, pl. 38, fig. A. — GALIL, 1988b : 166, fig. 4. — GALIL & CLARK, 1990 : 381 (New Caledonia ; full synonymy). — JENG, 1994 : 317, fig. 6 B (color photograph). — TAKEDA, 1994 : 212, fig. 4 (color photograph).
Trapezia davaoensis Ward, 1941 : 14, fig. 27.
Trapezia ferruginea forma *guttata* – PATTON, 1966 : 285 (Queensland, Australia) ; 1974 : 223 (Queensland, Australia).
Trapezia sp. COLIN & ARNESON, 1995 : 214, fig. 1009 (color photograph).

MATERIAL EXAMINED. — **New Caledonia.** LAGON : st. 23, Nouméa, 23.5.1984, 22°24'S, 166°25'E, 10-18 ♂ : 1 ♂ (MNHN-B 25080). — East lagoon : st. 612, 22°08.90'S, 167°00.50'E, 46-48 m, 5.8.1986 : 1 ♂ (MNHN-B 25005). — St. 613, 22°07.30'S, 166°59.50'E, 45-50 m, 5.8.1986 : 2 ♀ (MNHN-B 25006). — St. 625, 21°59.20'S, 166°53.60'E, 34-40 m, 6.8.1986 : 8 ♂, 3 ♀ (MNHN-B 25007). — St. 625, 21°59.20'S, 166°53.60'E, 34-40 m, 6.8.1986 : 1 ♂, 1 ♀ (MNHN-B 25008, photographed). — St. 642, 21°54.20'S, 166°42.20'E, 44-47 m, 7.8.1986 : 1 ♀ (MNHN-B 25009). — St. 651, 21°48.0'S, 166°36.40'E, 48 m, 7.8.1986 : 1 ♀ (MNHN-B 25010). — St. 671, 21°38.1'S, 166°25.50'E, 36-39 m, 8.8.1986 : 3 ♂, 2 ♀ (MNHN-B 25011). — St. 702, 21°26.70'S, 166°08.20'E, 37 m, 10.8.1986 : 1 ♂, 1 ♀ (MNHN-B 25013). — St. 710, 21°24.0'S, 166°02.50'E, 30-31 m, 10.8.1986 : 3 ♂, 1 ♀ (MNHN-B 25012). — St. 738, 22°09.80'S, 167°00.20'E, 59-61 m, 12.8.1986 : 1 ♀ (MNHN-B 25014). — St. 800, 21°00.0'S, 165°30.65'E, 33 m, 9.1.1987 : 2 ♂, 1 ♀ (MNHN-B 25015). — Northwest lagoon : st. DW 1014, 20°08.70'S, 163°53.40'E, 22-23 m, 3.4.1988 : 1 ♀ (MNHN-B 25016). — St. DW 917, 20°55.60'S, 164°26.80'E, 25-27 m, 26.4.1988 : 1 ♂ (MNHN-B 25017). — St. DW 921, 20°51.20'S, 164°26.60'E, 10-11 m, 27.4.1988 : 1 ♂, 1 ♀ (MNHN-B 25018). — St. DW 940, 20°38.10'S, 164°15.50'E, 10 m, 27.4.1988 : 1 ♂ (MNHN-B 25019). — North lagoon : st. DW 1088, 19°45.50'S, 163°57.70'E, 23 m, 24.10.1989 : 1 ♂, 1 ♀ (MNHN-B 25020). — St. DW 1128, 19°31.20'S, 163°52.20'E, 26 m, 26.10.1989 : 1 ♀ (MNHN-B 25021). — St. DW 1139, 19°23.60'S, 163°47.0'E, 39 m, 27.10.1989 : 1 ♂, 1 ♀ (MNHN-B 25022). — St. DW 1159, 19°13.0'S, 163.06.90'E, 50 m, 30.10.1989 : 1 ♂ (MNHN-B 25023). — Ile des Pins, 22°32'S, 167°26'E, 32 m, 18.7.1985 : 1 ♂, 1 ♀ (MNHN). — Barrier reef, Dumbéa Pass, 30 m, on *Seriatopora* sp. & *Stylophora* sp., coll. J. L. MENOU : 1 ♂ (MNHN-B 25024). — Récif M'bere, pente externe, 10 m, 5.5.1993 : 1 ♂ (MNHN-B 25365). — St. 127, Maître I., 22°19.80'S, 166°25.10'E, 5 m, on *Pocillopora* spp., 24.4.1995, coll. P. CASTRO : 4 ♂, 4 ♀ (MNHN-B 25025). — St. 140, Sêche Croissant reef, 22°19.90'S, 166°22.30'E, 13 m, on *Pocillopora* sp., 26.4.1995, coll. P. CASTRO : 1 ♀ (MNHN-B 25026). — St. 140, Sêche Croissant reef, 22°19.90'S, 166°22.30'E, 13 m, on *Acropora* sp., 26.4.1995, coll. P. CASTRO : 2 ♂, 1 ♀ (MNHN-B 25027, photographed).

Loyalty Is. MUSORSTOM 6 : st. DW 431, 20°22.25'S, 166°10.0'E, 21 m, 18.2.1989 : 1 ♂, 1 ♀ (MNHN-B 25028). —

St. DW 432, 20°20.95'S, 166°10.75'E, 21 m, 18.2.1989 : 1 ♀ (MNHN-B 25030). — St. DW 434, 20°21.21'S, 166°08.64'E, 23 m, 18.2.1989 : 1 ♂ (MNHN-B 25029). — PLOUVEAL : st. 1226, Ouvéa lagoon, 20°32.0'S, 166°24.0'E, 21 m, 9.9.1992, coll. R. LEBORGNE : 2 ♀ (MNHN-B 25033). — St. 1231, Ouvéa lagoon, 20°31.20'S, 166°22.90'E, 23 m, 9.9.1992, coll. R. LEBORGNE : 1 ♀ (MNHN-B 25035). — St. 1219, Ouvéa lagoon, 20°30.0'S, 166°28.0'E, 15 m, 11.9.1992, coll. R. LEBORGNE : 1 ♂ (MNHN-B 25031). — St. 1222, Ouvéa lagoon, 20°28.0'S, 166°30.0'E, 15 m, 12.9.1992, coll. R. LEBORGNE : 1 ♂ (MNHN-B 25032). — St. 1230, Ouvéa lagoon, 20°35.0'S, 166°22.90'E, 18 m, 15.9.1992, coll. R. LEBORGNE : 1 ♀ (MNHN-B 25034). — St.1227, Ouvéa lagoon, 20°36.90'S, 166°25.0'E, 12 m, 15.9.1992, coll. R. LEBORGNE : 1 ♀ (MNHN-B 25036).

Vanuatu. Port Patterson : 1 ♀ (BMNH 1896.1.2.21-23).

Chesterfield Is. CHALCAL 1 : st. D 24, 19°10.78'S, 158°37.10'E, 38 m, 18.7.1984 : 1 ♂, 1 ♀ (MNHN-B 25037). — St. D 39, 20°28.90'S, 158°40.70'E, 40 m, 23.7.1984 : 6 ♂, 5 ♀ (MNHN-B 25038). — St. D 51, 21°13.21'S, 158°42.50'E, 55 m, 24.7.1984 : 1 ♂, 1 ♀ (MNHN-B 25039). — CORAIL 2 : st. DW 12, 20°47.74'S, 161°36.32'E, 59 m, 20.7.1988 : 2 ♂, 1 ♀ (MNHN-B 25040). — St. DW26, 20°21.98'S, 161°04.87'E, 62 m, 22.7.1988 : 1 ♂ (MNHN-B 25041). — St. DW 38, 19°21.62'S, 158°42.50'E, 61 m, 23.7.1988 : 1 ♂, 1 ♀ (MNHN-B 25042). — St. 44, 19°21.82'S, 158°22.95'E, 48m, 23.7.1988 : 1 ♂, 1 ♀ (MNHN-B 25043). — St. DW 59, 19°18.50'S, 158°56.55'E, 50 m, 24.8.1988 : 1 ♀ (MNHN-B 25044). — St. DW 84, 19°12.0'S, 158°56.80'E, 16-26 m, 25.8.1988 : 5 ♂, 4 ♀ (MNHN-B 25045). — St. DW 88, 19°05.98'S, 158°55.85'E, 32 m, 26.8.1988 : 3 ♂, 1 ♀ (MNHN-B 25046). — St. CP 90, 19°02.83'S, 158°56.26'E, 44-48 m, 26.8.1988 : 4 ♂, 5 ♀ (MNHN-B 25047). — St. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 7 ♂, 12 ♀ (MNHN-B 25048). — St. DW 94, 19°06.0'S, 158°50.0'E, 36-56 m, 27.8.1988 : 2 ♂, 1 ♀ (MNHN-B 25049). — St. DW 97, 19°06.0'S, 158°38.43'E, 32 m, 27.8.1988 : 1 ♂ (MNHN-B 25050). — St. DW 98, 19°04.32'S, 158°31.66'E, 39 m, 27.8.1988 : 1 ♀ (MNHN-B 25051). — St. DW 99, 19°06.03'S, 158°38.95'E, 52 m, 27.8.1988 : 4 ♂, 3 ♀ (MNHN-B 25052). — St. DW 101, 19°08.99'S, 158°26.24'E, 37 m, 27.8.1988 : 4 ♂, 2 ♀ (MNHN-B 25053). — St. DW 103, 19°01.01'S, 158°31'94'E, 58 m, 27.8.1988 : 2 ♂ (MNHN-B 25054). — St. DW 105, 19°08.91'S, 158°39.19'E, 35 m, 27.8.1988 : 5 ♂, 4 ♀ (MNHN-B 25055). — St. DW115, 19°22.01'S, 158°37.62'E, 44 m, 28.8.1988 : 3 ♂, 2 ♀ (MNHN-B 25056). — St. DW 127, 19°27.73'S, 158°27.30'E, 44-45 m, 29.8.1988 : 5 ♂, 1 ♀ (MNHN-B 25057). — St. DW 128, 19°27.89'S, 158°30.44 'E, 38 m, 29.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25058) — St. DW132, 19°31.0'S, 158°28.64'E, 38-50 m, 30.8.1988 : 1 ♂ (MNHN-B 25059). — St. DW 136, 19°31.20'S, 158°16.0'E, 37 m, 30.8.1988 : 4 ♀ (MNHN-B 25060). — St. DW 137, 19°34.0'S, 158°14.60'E, 32 m, 30.8.1988 : 1 ♂, 2 ♀ (MNHN-B 25061). — St. DW 138, 19°33.85'S, 158°17.57'E, 31 m, 30.8.1988 : 1 ♀ (MNHN-B 25062). — St. DW 144, 19°27.73'S, 158°23.28'E, 50 m, 30.8.1988 : 2 ♂, 2 ♀ (MNHN-B 25063). — St. DW 145, 19°37.0'S, 158°19.12'E, 54 m, 30.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25064). — St. DW 148, 19°54.08'S, 158°27.12'E, 34 m, 1.9.1988 : 3 ♂, 2 ♀ (MNHN-B 25065). — St. DW 150, 19°54.0'S, 158°25.20'E, 39 m, 1.9.1988 : 1 ♀ (MNHN-B 25066). — St. DW 153, 19°52.0'S, 159°23.20'E, 45 m, 1.9.1988 : 2 ♂, 1 ♀ (MNHN-B 25068). — St. DW 159, 19°46.04'S, 158°19.98'E, 52 m, 1.9.1988 : 2 ♂, 1 ♀ (MNHN-B 25067). — St. DW 163, 19°41.46'S, 158°15.62'E, 23 m, 2.9.1988 : 3 ♂, 6 ♀ (MNHN-B 25069). — St. DW 165, 19°41.41'S, 158°21.85'E, 45 m, 2.9.1988 : 4 ♂, 3 ♀ (MNHN-B 25070).

Bellona Reefs. St. 4 DE, 21°19.0'S, 158°48.0'E, 66 m, 19.10.1985 : 2 ♂, 1 ♀ (MNHN-B 25071). — St. 8 DE, 21°22.60'S, 158°52.0'E, 48-54 m, 19.10.1985 : 1 ♂, 1 ♀ (MNHN-B 25072). — St. 9 DE, 21°23.70'S, 158°54.20'E, 47-51 m, 20.10.1985 : 6 ♂ (one with bopyrid), 5 ♀, 1 juvenile (MNHN-B 25073). — St. 10 DE, 21°24.30'S, 158°56.80'E, 52 m, 22.10.1985 : 1 ♀ (MNHN-B 25074). — St. 12 DE, 21°49.70'S, 159°30.30'E, 47-50 m, 22.10.1985 : 2 ♂, 2 ♀ (MNHN-B 25075). — CORAIL 1 : 10.8.1988 : 1 ♀ (MNHN-B 25076).

Queensland, Australia. Old Tree I., Capricorn Group, 23°30'S, 152°05'E, on *Seriatopora hystrix*, 11-12.1966. coll. Y. C. YALDWYN : 1 ♂, 1 ♀ (AM P15956). — 80 km east Dunk I., 17°53'S, 146°53'E, *Soela*, cr. 6, st. 89, 9.12.1985 : 1 ♀ (QM W12304).

Middleton Reef. Site 12 A, patch reef near channel, 29°27.6'S, 159°06.7'E, 6.12.1987 : 1 ♂ (AM P38188). — Site 19 A, 29°27.6'S, 159°06.8'E, 12.1987 : 6 ♂, 11 ♀ (AM P38187).

Elizabeth Reef. Reef flat near *Yoshida Maru Iwaki* wreck, 29°55.8'S, 159°01.3'E, on *Acropora valida*, *Pocillopora damicornis* & *Stylophora pistillata*, 14.12.1987, coll. J. LOWRY : 12 ♂, 9 ♀ (AM P38195).

Lord Howe I. Erscott's Hole, 31°33'S, 159°04'E, 13.12.1979, coll. N. COLEMAN : 2 ♂, 1 ♀ (AM P38702). — Malabar, 31°33'S, 159°05'E, 15 m, 23.2.1980 : 1 ♂ (AM P38944).

COLOR. — *T. guttata* can be easily identified by its characteristic color. Live specimens have a white to

orange-white (cream) carapace with a brown line crossing along the anterior borders between the eyes (pls 2 B & 4). The brown line is typically bordered anteriorly by a thin red-brown to dark-pink line. The acute tips of the supraorbital angle and epibranchial teeth are red-brown or brown. The chelipeds are orange brown to light brown with brown reticulations along the dorsal portion of the propodus. The walking legs are light brown with brown-red spots. Spots are mostly in the form of elongate streaks along the propodus and dactylus.

Preserved specimens can be readily identified by the reddish spots on the walking legs, particularly in larger specimens. The anterior brown band of the carapace may be visible, particularly when seen in contrast with the opaque whitish color that remains on the dorsal surface of the carapace for some time. Also visible in preserved specimens is a brown line across the anterior portion of the sternum and often a faint network of circular lines on the anterior portion of the ventral surface of the carapace.

Color photographs of *T. guttata* were given by NAGAI & NOMURA (1988), JENG (1994), TAKEDA (1994), and COLIN & ARNESON (1995). A color illustration in SAKAI (1976) does not depict the true colors of the species.

REMARKS. — In addition to its diagnostic color pattern, *T. guttata* can be easily identified by its long and slender fingers (when closed, the dactylus crosses and extends beyond the immovable finger), slender chelipeds (narrow propodus and merus that is usually longer than broad), anterolateral borders that are almost parallel to each other, and supraorbital angles and epibranchial teeth in the form of acute spines. There is no suture between the second and third thoracic sternites.

Members of the species are small in size, reaching a maximum carapace width of 12.0 mm among the many specimens examined during the course of this investigation. It is very common in the eastern Coral Sea, typically second only to *T. cymodoce*.

T. guttata has been recorded from many locations in the Indo-west Pacific region (GALIL, 1988b) except the Hawaiian Islands and Easter Island.

Trapezia lutea sp. nov.

Figs 2 C, 2 D & 3 A-C, pls 2 C & 5 A

Trapezia cymodoce – BOONE, 1934 : 168, pl. 87 (Queensland, Australia). — HWANG & YU, 1980 : 153, pl. 9, fig. 1. — SERÈNE, 1984 : 272 (part). — GALIL & CLARK, 1990 : 378 (New Caledonia, part). — JENG, 1994 : 315, fig. 5 (color photograph). — JONES & MORGAN, 1994 : 178 (color photograph). non *T. cymodoce* (Herbst).

TYPE MATERIAL. — **New Caledonia.** St. 127, Maître I., 22°19.80'S, 166°25.10'E, 5 m, on *Pocillopora* sp., 24.4.1995, coll. P. CASTRO : 1 ♂ holotype, cw 8.4 mm, cl 6.8 mm (MNHN-B 25222).

Chesterfield Is. CORAIL 2 : st. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : ♂ cw 9.7 mm, cl 7.9 mm, ♀ cw 9.5 mm, cl 7.6 mm paratypes (MNHN-B 25223) ; ♂ cw 8.4 mm, cl 6.9 mm, ♀ cw 7.6 mm, cl 6.0 mm paratypes (USNM 277633). — St. DW 84, 19°12.0'S, 158°56.80'E, 16-26 m, 25.8.1988 : ♂ cw 9.0 mm, cl 7.5 mm paratype (AM P45527), ♀ cw 7.4 mm, cl 6.0 mm paratype (AM P45528).

ADDITIONAL MATERIAL EXAMINED. — **New Caledonia.** Barrier reef, Dumbéa Pass, 30 m, on *Seriatopora* sp. & *Stylophora* sp., coll. J. L. MENOU : 1 juvenile ♂, 1 ♀ (MNHN-B 25192). Récif M'bere, pente externe, 10 m, 5.5.1993 : 1 ♂, 1 ♀ (MNHN-B 25365). — Material identified by GALIL & CLARK (1990) as *Trapezia cymodoce* : LAGON : st. 79, Prony Bay, Ouen I., 22°29'S, 166°29'E, 16 m, 21.8.1984 : 1 ♀ (MNHN-B 25230). — North lagoon : st. 480, 18°56'S, 163°29'E, 31 m, 2.3.1985 : 1 ♂ (MNHN-B 25231).

Loyalty Is. Ouvéa lagoon, 1992 : 1 ♂, 1 ♀ (MNHN-B 25224).

Chesterfield Is. CORAIL 2 : st. DW 46, 19°18.54'S, 158°20.0'E, 21 m, 23.7.1988 : 1 ♂ (MNHN-B 25225). — St. DW 84, 19°12.0'S, 158°56.80'E, 16-26 m, 25.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25226). — St. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 3 ♂, 4 ♀ (MNHN-B 25227) ; 1 ♂ (AM P45371). — St. DW 165, 19°41.41'S, 158°21.85'E, 45 m, 2.9.1988 : 1 ♂, 1 ♀ (MNHN-B 25228).

French Polynesia. Moorea, 1982, coll. O. ODINETZ : 1 ♂ cw 4.4 mm, cl 3.5 mm, 1 ♀ cw 6.5, cl 5.2 mm (MNHN-B 25332).

Philippine Islands. Material identified by O. ODINETZ as *T. cymodoce* : MUSORSTOM 2 : 12.1981, 1 ♂, 1 ♀ (MNHN-B 9679). — 12.1981, 1 ♂, 1 ♀ (MNHN-B 9680).

Viet Nam. Nhatrang, 14.5.1930, coll. de LAMESSAN : 1 ♂, 1 ♀ (MNHN-B 23074).

Western Australia. Kendrew I., Dampier Archipelago, 20.5.1974, Crown-of-Thorns Survey : 1 ♂, 1 ♀ (WAM 504-86).

Cocos (Keeling) Is., Eastern Indian Ocean. Flying Fish Cove, st. 1, 10-15 m, 11.2.1987, coll. G. MORGAN : 1 ♀ (WAM 600-87). — Landing Place, North Keeling I., st. 13, 17.2.1989, coll. G. MORGAN : 1 ♂, 1 ♀ (WAM 701-89). — Home I., st. 27, coll. L. MARSH : 1 ♂, 1 ♀ (WAM 836-89 ; photographs on pp. 178-179, JONES & MORGAN, 1994).

Maldive Is. Addu Wiack, 15 m, 1.1958 : 2 ♂, 1 ♀ (MNHN-B 23044).

Western Indian Ocean. Mombasa, Kenya, coll. A. J. BRUCE, 1972 : 1 ♀ (MNHN-B 13337). — Aldabra I., 1954 : 2 ♂, 1 ♀ (MNHN-B 23060). — Mauritius, coll. P. CARIÉ, 1913 : 21 ♂, 20 ♀ (MNHN-B 25360). — Port Dauphin, Madagascar : 2 ♂, 1 ♀ (MNHN-B 13331). — Iles Glorieuses, coll. A. CROSNIER, 1.1973 : 1 ♂, 3 ♀ (MNHN-B 23046).

Material identified by R. SERÈNE as *T. cymodoce* : Port Victoria, Seychelles 15.2.1972, coll. A. J . BRUCE : 1 ♂, 1 ♀ (MNHN-B 25232). — Praslin, Ste Anne Bay, 19.2.1972, coll. A. J. BRUCE : 1 ♀ (MNHN-B 25233). Réunion. La Saline, 30 m, 18.12.1976, coll. S. RIBES : 1 ♂, 1 ♀ (MNHN-B 8939). — La Saline, 5 m, coll. S. RIBES : 1 ♀ (MNHN-B 8941). — La Saline, 10 m, coll. S. RIBES : 1 ♀ (MNHN-B 8943). — La Saline, coll. S. RIBES : 1 ♂, 1 ♀ (MNHN-B 25247).

DESCRIPTION OF HOLOTYPE. — Carapace smooth, shiny, and slightly convex dorsally. Anterolateral borders of carapace slightly curved. Epibranchial teeth acute and directed upwards. Postorbital angles obtuse. Inner suborbital teeth subacute.

Frontal border wide, arched, and clearly cut into two rounded supraorbital angles and four rounded lobes. Median lobes with several small to microscopic teeth.

Incomplete suture between second and third thoracic sternites (sternal suture 2/3), conspicuous only distally. Third maxillipeds subrectangular. Ischium of endognath with scattered punctae but no granules ; dorsal border with microscopic teeth.

Chelipeds massive and slightly unequal. Right merus armed with seven teeth ; left with six. Distal and proximal angles on anterior margin of carpus with blunt teeth. Well developed tomentum, consisting of numerous long plumose setae, along upper and outer margin of merus, carpus, propodus, and proximal portion of dactylus. Tomentum is more developed on propodus, where setae are more numerous and longer. Upper margin of

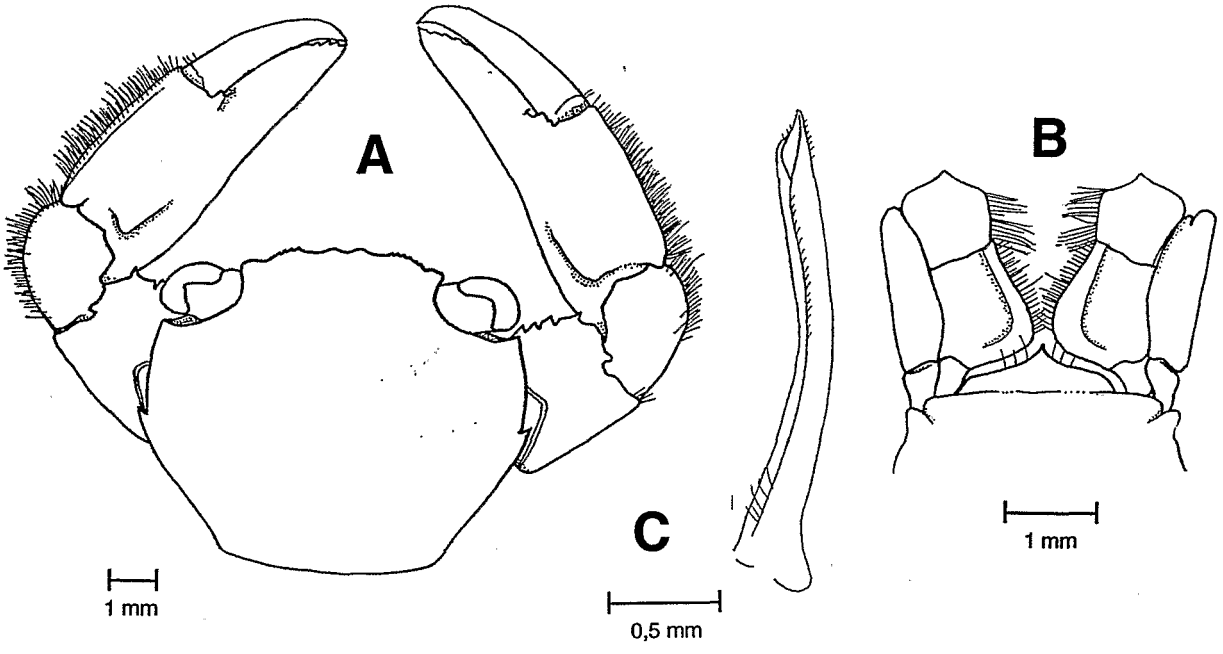

Fig. 3. — *Trapezia lutea* sp. nov., ♂ holotype, New Caledonia (MNHN-B 25222) : **A.** dorsal aspect of the carapace, **B.** anterior sternal region, **C.** first pleopod.

propodus slightly keeled ; lower margin cristate and armed with microscopic teeth. Fingers slender and slightly curved. Dactylus of both chelipeds armed with few small teeth ; immovable fingers with cutting edge.

Merus of walking legs laterally flattened with cristate dorsal margin. Dorsal margin of carpus, propodus, and dactylus with many slender, long setae. Few setae plumose. Distal end of dactylus curved with horny ridges at tip ; inner (posterior) margin of last walking leg (fifth pereiopod) with six thick, horny setae and, proximally, four transversal rows of setae.

Live color of carapace and chelipeds bright orange without any spots or dots (pl. 2 C). Anterior and lateral borders of carapace and anterior border of merus and carpus of chelipeds darker orange. Walking legs and ventral surface of carapace light orange ; upper surface of dactylus of legs darker orange. Tomentum of chelipeds colorless ; fingers brown. Eyes dark gray, almost black.

First pleopod long and slender. Apex slender and symmetrical.

ETYMOLOGY. — From the Latin *luteus* for yellow or yellow-orange. R. SERÈNE used this name for the first time to identify this species as a "variety" of *T. cymodoce* : *T. cymodoce* var. *lutea* (unpublished manuscript of a revision of the Trapeziidae, Raoul SERÈNE, ORSTOM, Paris ; pl. 5 A). The species is thus dedicated to the memory of Dr. SERÈNE.

COLOR. — Live specimens have orange carapace, chelipeds, and walking legs. There are no distinctive spots, dots, or markings other than the darker orange dactylus of the walking legs.

In preserved specimens color varies between orange and yellow-orange. Fingers appear light to dark brown. Two transversal rows of very pale yellow, almost white dots may be observed on the dorsal surface of the carapace in the largest specimens, very much as in *T. cymodoce*. The dots, however, are never a conspicuous orange-red color as in *T. cymodoce*. Similar very light dots have been observed in preserved specimens of all other species of *Trapezia* thus far examined. Patches of dark-brown granules were observed along the anterior and lateral borders of the carapace, eyestalks, and chelipeds of a very small preserved male from French Polynesia (MNHN-B 25332).

Color photographs of *T. lutea* referred to as *T. cymodoce* were given by JENG (1994), JONES & MORGAN (1994), and what is most probably *T. lutea* (specimens not examined) by NAGAI & NOMURA (1988) and TAKEDA (1994).

REMARKS. — *T. lutea* has been undoubtedly confused with *T. cymodoce* on account of the conspicuous tomentum on the chelipeds of both species. References to an orange or yellow "variety" of *T. cymodoce* exist in the literature (MIYAKE, 1983 ; SERÈNE, 1984). BOONE (1934) described specimens of *T. cymodoce* from Queensland, Australia as "vivid orange red". The presence of a tomentum, which is given in the description, plus the convex shape of the anterolateral borders of the carapace and the absence of a sternal suture reveals that at least the specimen shown in a photograph was *T. lutea* (pl. 87).

Further confusion was added by the similarities between *T. lutea* and *T. ferruginea*. Specimens described by LAURIE (1906) as combining the chelipeds of *T. cymodoce* with the carapace of *T. ferruginea* were most probably *T. lutea*. It has been found in material previously identified as *T. ferruginea* and, most frequently, as *T. cymodoce*.

T. lutea can be separated from *T. cymodoce* by : **1**) uniformly orange to yellow color (pls 2 C & 5 A) (purplish blue carapace with a transversal row of orange-red dots across the carapace in *T. cymodoce* (Fig. 2 A, pls 2 A & 3 A), **2**) dark portion of the dactylus of the chelipeds extends almost to the base of the dactylus (fig. 2 C) (it only extends to about two-thirds of the length of the dactylus in *T. cymodoce* ; (fig. 2 A), **3**) rounded anterolateral borders (figs 2 C & 3 A, pl. 5 A) (straight, almost parallel to each other in all except the largest specimens of *T. cymodoce* (fig. 2 A, pls 2 A & 3 A), **4**) blunt epibranchial teeth in many individuals (fig. 2 C), particularly large ones (almost always acute in *T. cymodoce* ; fig. 2 A), **5**) blunt tooth (fig. 2 C) on distal margin of carpus of merus of chelipeds (it is typically acute, except in the largest individuals, in *T. cymodoce* ; fig. 2 A), **6**) presence of a suture between second and third thoracic sternite only in smaller individuals (fig. 3 B) (always present in *T. cymodoce* ; fig. 2 B), **7**) relatively short and subacute inner suborbital teeth (longer and acute, particularly in the smaller individuals, in *T. cymodoce*), **8**) four to five transversal rows of setae on the inner margin of the last

walking leg (six to eight in *T. cymodoce*), and **9**) slightly shorter merus of the fourth pair of walking legs is slightly shorter, with a total length to maximum width ratio of 2.1 to 2.2 (longer in *T. cymodoce*, with a length to width ratio of 2.4 to 2.5).

T. lutea is overall smaller in size than *T. cymodoce*. Of the 50 specimens from all locations that were measured, the largest size recorded was for an exceptionally large pair from Western Australia (WA 504-86 : female cw 13.3 mm, cl 10.1 mm ; male cw 11.0 mm, cl 9.3 mm). It is very common for individuals of *T. cymodoce* to reach a carapace width of 15 mm or more. *T. lutea* is also much less common than *T. cymodoce* in the locations sampled in the Coral Sea region. Of 180 specimens from New Caledonia identified as *T. cymodoce* by GALIL & CLARK (1990) (MNHN-B 18195), only two proved to be *T. lutea*. This seems to be the case in other locations judging from their relative frequency in museum collections.

T. lutea is similar to *T. ferruginea* in color, the general shape of the carapace (rounded anterolateral borders and blunt epibranchial teeth, particularly in the larger individuals), absence of a sternal suture on the larger individuals, blunt teeth of the cheliped carpus, and in the shorter and subacute shape of the inner suborbital teeth. Large specimens of *T. lutea* may look very much like *T. ferruginea* but with tomentum on the chelipeds, that is, "intermediates" between *T. cymodoce* and *T. ferruginea*. The species can be separated from *T. ferruginea* by **1**) well developed tomentum (figs 2 C & 3 A) that consists of plumose setae and that is present along the entire upper and outer margin of chelipeds (only microscopic or, if evident, restricted to the carpus of chelipeds in *T. ferruginea*), **2**) sternal suture, complete or incomplete, present in most small individuals (fig. 3 B) (present only in juveniles in *T. ferruginea*), **3**) superior border of propodus of cheliped keeled or subacute (rounded in *T. ferruginea*), and **4**) four to five rows of transversal setae on the inner margin of the last walking leg (five to six in *T. ferruginea*). *T. lutea* is also smaller in size than *T. ferruginea*, which reaches a size comparable to that of *T. cymodoce*.

Differences between *T. lutea*, *T. cymodoce*, and *T. ferruginea* are summarized in table 1.

Some of the morphological features diagnostic for *T. lutea* vary according to size. The acute epibranchial teeth become obtuse in the larger individuals. Twelve individuals out of 48 sampled had obtuse teeth ; two had one of each on each side. Similarly, the presence of a thoracic suture is related to size. Of 48 individuals, sixteen had no suture while it was present but incomplete in twelve. Practically all individuals lacking a suture were among the largest sampled.

The tomentum is thicker and therefore more evident in the largest individuals. Numerous filaments of cyanobacteria often make the tomentum more conspicuous. The thickest tomentum was observed in the two smallest specimens examined, a male and a female from French Polynesia (MNHN-B 25332). Setae, often plumose, are abundant on the walking legs of some specimens. This, however, is a variable character. Setae of the legs are sometimes more abundant on one side of the animal than on the other. As in *T. cymodoce*, clumps of short, plumose setae are found on the surface of the chelipeds.

In addition to New Caledonia, its type location, *T. lutea* is known from the Loyalty and Chesterfield islands, French Polynesia, Taiwan, the Philippine Islands, Viet Nam, Western Australia, Cocos (Keeling) Islands, Maldive Islands, East Africa, the Seychelles, Réunion, Mauritius, and Madagascar. Color photographs demonstrate its presence in Japan (NAGAI & NOMURA, 1994 ; TAKEDA, 1994), Guam (unpublished photographs, P. W. GLYNN). It will undoubtedly be found in other Indo-west Pacific locations.

Trapezia punctipes sp. nov.

Figs 4 A-C, pl. 2 D

TYPE MATERIAL. — **Queensland, Australia.** Reef 1 km south west of Research Point, Lizard Island, 14°40'S, 145°28'E, 3m, on *Pocillopora damicornis*, 9.6.1995, coll. P. CASTRO & R. SPRINGTHORPE : 1 ♂ holotype, cw 14.3 mm, cl 12.1 mm (AM P45341) ; 1 ♂ paratype, cw 10.0 mm, cl 9.0 mm (MNHN-B 25283) ; 1 ♂ 13.2 mm, cl 11.5 mm. paratype (USNM 277632) ; 1 ♀ ovigerous cw 10.9 mm, cl 8.9 mm paratype, (AM P44627, photographed). — Reef 1 km south west of Research Point, Lizard Island, 14°40'S, 145°28'E, 3 m, on *Pocillopora damicornis*, 8.6.1995, coll. P. CASTRO & R. SPRINGTHORPE : 1 ♀ cw 16.0 mm, cl 12.9 mm paratype (AM P44629).

DESCRIPTION OF HOLOTYPE. — Carapace smooth, shiny, and slightly convex dorsally. Anterolateral borders of carapace slightly curved. Epibranchial teeth as slight notch. Postorbital angles obtuse. Inner suborbital teeth acute.

Frontal border wide, arched, and clearly cut into two rounded supraorbital angles and four rounded lobes. Median lobes with several irregular, microscopic teeth.

A faint scar but no suture between second and third thoracic sternites. Anterior border of sternum with numerous microscopic punctae and granules. Third maxilliped subrectangular. Ischium of endognath with

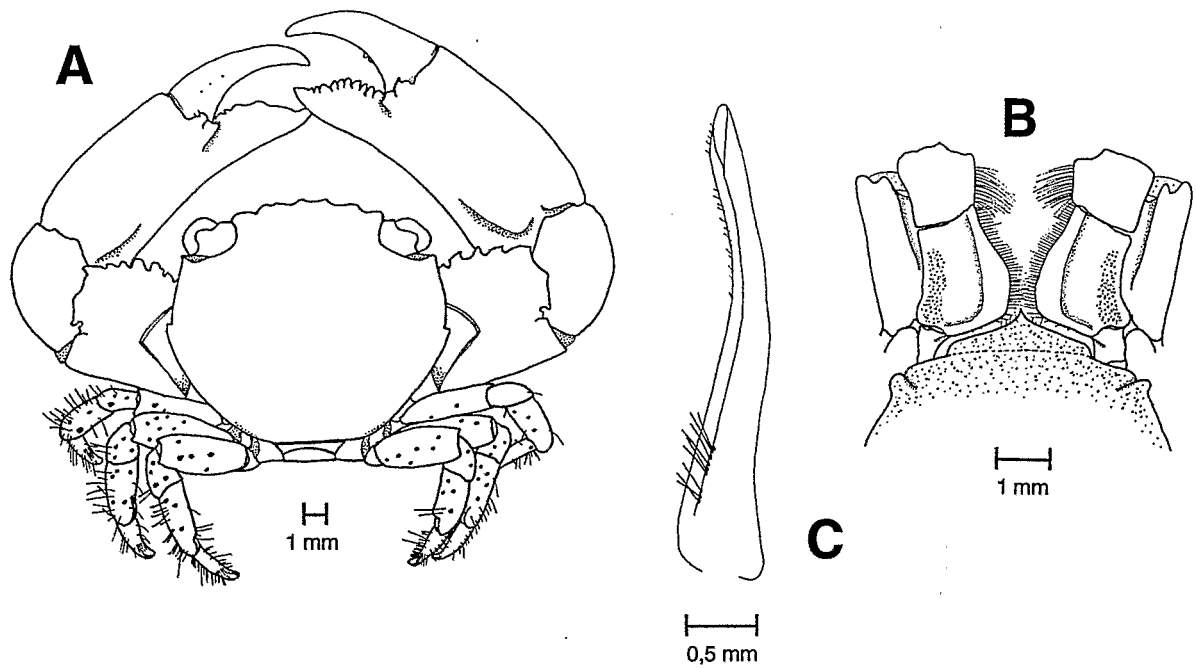

Fig. 4. — *Trapezia punctipes* sp. nov., ♂ holotype, Queensland, Australia (AM P 45341) : **A.** dorsal aspect of the carapace ; **B.** anterior sternal region ; **C.** first pleopod.

scattered punctae and irregular microscopic granules along proximal inner margin.

Chelipeds massive and slightly unequal. Right merus armed with four teeth ; left with five. Distal and proximal angles on anterior margin of carpus with blunt teeth. Few microscopic setae along outer margin of carpus and propodus. Upper margin of propodus rounded ; lower margin cristate and armed with microscopic teeth. Fingers slender and curved. Dactylus and immovable finger armed with large teeth in largest (right) cheliped ; dactylus of smallest cheliped with large teeth, immovable finger with cutting edge.

Merus of walking legs laterally flattened with cristate dorsal margin. Dorsal margin of carpus, propodus, and dactylus with many slender, long setae. Few setae plumose. Distal end of dactylus curved with horny ridges at tip ; inner (posterior) margin of last walking leg (fifth pereiopod) with five thick, horny setae and, proximally, four transversal rows of long setae serrated on two sides.

First pleopod long and slender. Apex slender and symmetrical.

Live color of carapace, chelipeds, and legs light orange. Walking legs with orange-red dots. Fingers of chelipeds brown. Eyes blue-gray.

ETYMOLOGY. — From the Latin *punctum* for dot and *pes* for foot in reference to the characteristic small spots, or dots, on the walking legs.

COLOR. — Live color of carapace is light orange (pl. 2 D). Walking legs are light orange with orange-red

dots on both their anterior and posterior sides. Eyes are blue-gray. Chelipeds are orange, with edges of segments darker orange ; fingers vary from light to dark brown-orange. The abdomen, with the exception of the largest male collected, are ornamented with orange-red dots. Dots are more common on the proximal abdominal segments. Similar orange-red dots are present on the ventral sternites. The outer edges of ventral sternites are darker orange. The antennae, antennules, flagellum of third maxilliped, and the second and first maxillipeds are white with minute black dots.

REMARKS. — The species can be easily distinguished by its characteristic color pattern : carapace and chelipeds uniformly orange but walking legs are spotted. Spots that are present on the walking legs but absent on the dorsal surface of the carapace is also characteristic of *T. guttata*. In *T. guttata*, however, the carapace is distinctively white except for a thin red-brown band along the anterior margin (pls 2 B & 4). *T. punctimanus* ODINETZ has small dots that are restricted to the chelipeds. Its carapace and walking legs are orange to light brown. The striking blue-grey color of the eyes of *T. punctipes* is also characteristic. A somewhat similar green-grey eye color is characteristic of *T. formosa* from the eastern Pacific (CASTRO, 1982 ; 1996). Eye color is unfortunately lost in preserved specimens.

Live specimens of *T. ferruginea* (Latreille), a close species, have a uniformly colored ("yellowish bluish-grey") carapace and a red-dot on the propod of the walking legs (GALIL, 1988b). This color pattern was given for specimens from the Red Sea, the type locality. A similar orange-red dot is clearly visible in preserved specimens from the western Pacific (see discussion of *T. ferruginea*). Live color in eastern Pacific populations of *T. ferruginea* is orange to brown-orange carapace with similarly colored walking legs that lack spots or a distal red dot (CASTRO, 1982 ; 1996). *T. serenei*, another morphologically similar species, has no spots on its walking legs and the carapace is orange-pink to light purple with edges darker in color.

Morphological features described for the type agree for the most part with the other four specimens in the collection. Carapace width of the available material varies from 10.9 mm to 16.0 mm in the two females and 10.0 mm to 14.3 mm in the three males ; carapace length from 9.0 mm to 13.0 mm in females and 9.0 mm to 12.1 mm in males. One significant source of variation is the shape of the epibranchial teeth. They are acute and pointed upwards (very much as in *T. cymodoce*) in the three smallest individuals, reduced to notches in two individuals (including the holotype), and almost invisible in the largest female. Similarly, the upper margin of the cheliped propodus has an acute tooth in the two smallest individuals but it is reduced and rounded in the remaining three, also as in *T. cymodoce*. The anterolateral borders of the carapace are only slightly curved (almost parallel to each other on the lower portion immediately above the epibranchial teeth) in the two smallest individuals but it is more noticeably curved in the largest three. This shape is very similar to that of *T. ferruginea* but different from that of *T. cymodoce*, where the anterolateral borders are almost parallel to each other (see table 1). There is a suture between the second and third thoracic sternites in the smallest male but it is reduced in three other individuals (including the holotype) and absent in the largest female. A marked reduction in the size of the epibranchial teeth with an increase in the size of the carapace as well as the disappearance of the sternal suture with increased size is also a characteristic of *T. serenei*. The suture is always present in *T. cymodoce* but absent in *T. ferruginea*.

T. punctipes shares with *T. ferruginea* an absence of tomentum along the chelipeds and, in the larger individuals, blunt epibranchial teeth, rounded anterolateral borders of the carapace, and the absence of a sternal suture. Smaller individuals of *T. punctipes* share with *T. cymodoce* acute epibranchial teeth and a sternal suture. Another similarity with *T. cymodoce* is the acute shape of the inner suborbital tooth. It is subacute in *T. ferruginea*. Most morphological characteristics of *T. punctipes* are shared with *T. serenei*. All of these species can nevertheless be easily distinguished from one another by their color, which unfortunately is gradually lost in preserved specimens.

Specimens collected by PATTON (1966) at Restoration Rock, northern Queensland, Australia possibly represent *T. punctipes*. Specimens were described as "orange colored with blue eyes". Although assigned to *T. ferruginea*, it was added that the specimens "may well represent a different species". Other Queensland specimens collected and identified by W. K. PATTON as *T. ferruginea* most probably were *T. serenei* (see discussion of *T. serenei*).

T. punctipes is known only from Queensland, Australia but it may prove to show a much wider distribution.

Trapezia rufopunctata (Herbst, 1799)
Pl. 5 B

Cancer rufopunctatus Herbst, 1799 : 54, pl. 47, fig. 6.

Trapezia rufopunctata – LATREILLE, 1828 : 695. — A. MILNE EDWARDS, 1873 : 258 (New Caledonia). — PATTON, 1966 : 285 (Queensland, Australia). — SAKAI, 1976 : 509, pl. 182, fig. 1 (color). — SERÈNE, 1984 : 276, fig. 184, pl. 39, fig. A. — GALIL & LEWINSOHN, 1985a : 209, figs 1-6 (full synonymy). — ALLEN & STEENE, 1994 : 159 (color photograph). — JENG, 1994 : 317, fig. 7 (color photograph). — JONES & MORGAN, 1994 : 179 (color photograph). — COLIN & ARNESON, 1995 : 214, fig. 1008 (color photograph).

MATERIAL EXAMINED. — **New Caledonia.** 1 ♂, 1 ♀ (MNHN-B 4345).

Chesterfield Is. CORAIL 2 : st. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 1 ♂ (MNHN-B 25077).

Queensland, Australia. Yonge Reef, off Lizard Island, 14°40'S, 145°28'E, 5 m, on *Pocillopora eydouxi*, 26.11.1975, coll. N. COLMAN : 1 ♀ (AM P21843). — Lady Elliott I., 5 m, on *Acropora* sp., 8.8.85, P. DAVIE & D. POTTER : 2 ♂, 1 ♀ (QM W12099).

COLOR. — The carapace, chelipeds, and legs are ornamented with red dots on a cream-colored background (pl. 5 B). This color pattern remains visible in preserved specimens for many decades. The size and distribution of spots vary widely (GALIL & LEWINSOHN, 1985a).

Color photographs were given by TAKEDA (1986), NAGAI & NOMURA (1988), JONES & MORGAN (1994), TAKEDA (1994), and COLIN & ARNESON (1995).

REMARKS. — *T. rufopunctata* can be confused with *T. flavopunctata* since both species reach a large size, have a somewhat similar color pattern, and the inner margin of the cheliped propodus shows two rows of thick tubercles that give the appearance of a serrated border. The carapace of *T. flavopunctata*, however, has large yellow spots on a red background and the frontal teeth are rounded, not acute (triangular), as in *T. rufopunctata* (GALIL & LEWINSOHN, 1985a). Both species are widely distributed throughout the Indo-west Pacific region.

T. rufopunctata has also been confused with *T. tigrina* EYDOUX & SOULEYET, which is also characterized by red dots on a cream or pink background. *T. tigrina* has never been reported from the Coral Sea region (GALIL & LEWINSOHN, 1984). *T. rufopunctata* can be easily distinguished, however, because of the conspicuously larger size of fully grown individuals, its prominent, acute frontal teeth, and by the presence of prominent, teeth-like granules along the lower margin of the cheliped propodus (GALIL & LEWINSOHN, 1985a). The granules along the lower margin of the cheliped propodus are small, almost microscopic, in *T. tigrina* (fig. 6.1 *in* CASTRO & HUBER, 1997).

T. rufopunctata has a wide distribution across the Indo-west Pacific region (GALIL & LEWINSOHN, 1985a). It appears to be absent from the Red Sea and Easter Island.

Trapezia septata Dana, 1852
Pls 2 E & 6

Trapezia septata (var. ?) Dana, 1852b : 260. — GALIL & LEWINSOHN, 1985b : 288, figs 2, 5, 6 (Queensland, Australia, and New Caledonia ; full synonymy). — GALIL & CLARK, 1990 : 382 (New Caledonia). — JONES & MORGAN, 1994 : 180 (color photograph).

Trapezia areolata – HELLER, 1868 : 25. — MCNEILL, 1968 : 68 (Queensland, Australia). — AUSTIN *et al.*, 1980 : 167 (Queensland, Australia). — HEALY & YALDWYN, 1970 : pl. 45 (color photograph). — SAKAI, 1976 : 508, pl. 181, fig. 2 (color). — MIYAKE, 1983 : 139, pl. 47, fig. 3 (color photograph). — ABELE, 1984 : 128, 131 (Queensland, Australia). — TAKEDA, 1994 : 212, fig. 1 (color photograph).

Trapezia reticulata Stimpson, 1858 : 37. — ODINETZ, 1984 : 444, figs 3 D, 3d, 4 D.

Trapezia areolata var. *inermis* A. Milne Edwards, 1873 : 259, pl. 10, fig. 6 (New Caledonia).

Trapezia ferruginea var. *areolata* – CALMAN, 1900 : 19 (Queensland, Australia). — WARD, 1933 : 254 (Queensland, Australia).

Trapezia ferruginea forma *areolata* – PATTON, 1966 : 285 (Queensland, Australia) ; 1974 : 224, fig. 1 (Queensland, Australia).

Trapezia cymodoce forma *areolata* – LASSIG, 1977 : 86 (Queensland, Australia).

MATERIAL EXAMINED. — **New Caledonia.** LAGON : st. 161, Prony Bay, Ouen I., 22°34'S, 166°38'E, 20 m, 24.8.1984 : 1 ♂ (MNHN-B 25081). — St. 249, Prony Bay, Ouen I., 22°25'S, 166°42'E, 11 m, 23.10.1984 : 1 ♂, 1 ♀ (MNHN-B 25082). — Renaurd I., 26.7.1986 : 1 ♂, 1 ♀ (MNHN-B 25078). — Tenia reef, 22°02'S, 165°55'E, 2 m, 29.4.1993 : 1 ♂, 2 ♀ (MNHN-B 25079). — Southwest lagoon : coll. P. TIRARD : 1 ♂ (MNHN-B 25083). — Barrier reef, Dumbéa Pass, 30 m, on *Seriatopora* sp. & *Stylophora* sp., coll. J. L. MENOU : 2 ♂, 1 ♀ (MNHN-B 25084). — Récif M'bere, pente externe, 10 m, 5.5.1993 : 2 ♂, 3 ♀ (MNHN-B 25366).

New Caledonia. St. 127, Maître I., 22°19.80'S, 166°25.10'E, 5 m, on *Pocillopora* spp., 24.4.1995, coll. P. CASTRO : 1 ♂, 1 ♀ (MNHN-B 25085), 1 ♀ (USNM 277635). — St. 140, Sêche Croissant reef, 22°19.90'S, 166°22.30'E, 13 m, on *Pocillopora* sp., 26.4.1995, coll. P. CASTRO : 1 ♀ (MNHN-B 25086). — St. 140, Sêche Croissant reef, 22°19.90'S, 166°22.30'E, 13 m, on *Acropora* sp., 26.4.1995, coll. P. CASTRO : 1 ♂ (MNHN-B 25088, photographed). — St. 107, Boulari Pass, 22°29.90'S, 166°26.55'E, 10-20 m, 28.4.1995, on *Pocillopora* spp., 28.4.1995, coll. P. HAMEL : 3 ♂, 1 ♀ (MNHN-B 25087). — Material identified by A.MILNE EDWARDS (1873) as *Trapezia areolata* var. *inermis* (type material) : coll. M. BALANSA : 3 ♂, 4 ♀ (MNHN-B 2915). — Coll. M. BALANSA : 2 ♂, 3 ♀ (MNHN-B 2916).

Loyalty Is. PLOUVEAL : st. 1226, Ouvéa lagoon, 20°32.0'S, 166°24.0'E, 21 m, 9.9.1992, coll. R. LEBORGNE : 2 ♂, 3 ♀ (MNHN-B 25089).

Matthew I. VOLSMAR : st. P 21, 20°59.20'S, 170°01.90'E, 10 m, 3.6.1989 : 1 ♂ (MNHN-B 25090). — St. P 27, 20°59.20'S, 170°01.90'E, 45 m, 4.6.1989 : 1 ♂, 2 ♀ (MNHN-B 25091).

Solomon Islands. Santa Cruz Is., coll. E. TROUGHTON & A. R. LIVINGSTON : 1 ♀ (AM P9164).

Vanuatu. Malekula I., coll. Lt. CROST : 3 ♂, 2 ♀ (AM P1302).

Chesterfield Is. CORAIL 2 : st. DW 84, 19°12.0'S, 158°56.80'E, 16-26 m, 25.8.1988 : 5 ♂, 5 ♀ (MNHN-B 25092). — St. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 12 ♂, 15 ♀ (MNHN-B 25093). — St. DW 101, 19°08.99'S, 158°26.24'E, 37 m, 27.8.1988 : 1 ♂ (MNHN-B 25094). — st. DW 136, 19°31.20'S, 158°16.0'E, 37 m, 30.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25095). — St. DW 163, 19°41.46'S , 158°15.62'E, 23 m, 2.9.1988 : 2 ♂, 3 ♀ (MNHN-B 25096).

Bellona Reefs. CORAIL 1 : 10.8.1988 : 1 ♀ (MNHN-B 25097).

Diamond Islets. West Cay, 13°11'S, 143°43'E, 23.10.1964, coll. D. F. McMICHAEL & J. C. YALDWYN : 3 ♂, 1 ♀ (AM P16977). — WestCay, 13°11'S, 143°43'E, 27.10.1964, coll. D. F. McMICHAEL & J. C. YALDWYN : 1 ♂, 2 ♀ (AM P 16978).

Kenn Reef. 21°15'S, 155°45'E, 2.10.1960, coll. D. F. McMICHAEL : 1 ♀ (AM P16947).

Flinder Reefs. 26°59'S, 153°29'E, 10.3.1989, coll. P. DAVIE, J. SHORT & P. LAWLESS : 12 ♂, 16 ♀ (QM W16225).

Queensland, Australia. Murray I., Torres Strait, 09°56'S, 144°04'E, 9.1907, coll. C. HEADLEY & A. R. McCULLOCH : 1 ♂, 1 ♀ (AM P 7532). — Outer Barrier Reef, H.M.A.S. *Geranium*, 1924 : 1 ♀ (AM P8015). — Batt Reef, on *Pocillopora* sp., Great Barrier Reef Expedition, 1929 : 2 ♂, 1 ♀ (BMNH 1937.9.21.180-182). — Low Is., on *Pocillopora* sp., Great Barrier Reef Expedition, 1929 : 1 ♂, 2 ♀ (BMNH 1937.9.21.180-182). — One Tree I., Capricorn Group, 23°30'S, 152°05'E, on *Pocillopora damicornis*, 3.10.1972, coll. D. F. HOESE : 1 ♂, 1 ♀ (AM P18875). — One Tree I., Capricorn Group, 23°30'S, 152°05'E, on *Pocillopora damicornis*, 4.10.1972, coll. D. F. HOESE : 1 ♂, 1 ♀ (AM P18874). — One Tree I., Capricorn Group, 23°30'S, 152°05'E, on *Seriatopora* sp., 3.10.1972, coll. D. F. HOESE : 1 ♂ (AM P18876). — Lagoon, Lizard Island, 14°40'S, 145°28'E, on *Seriatopora* sp., 2.11.1975, coll. N. COLEMAN : 1 ♂, 1 ♀ (AM P25169). — Heron I., 23°27'S, 151°55'E, on *Pocillopora* sp., 11.1976, coll. P. SALE & A. AUSTIN : 1 ♀ (AM P42562). — Seaforth I., 24.3.1987, coll. P. DAVIE & J. SHORT : 1 ♂ (QM W14396). — Reef 1 km south west of Research Point, Lizard Island, 14°40'S, 145°28'E, 3 m, on *Pocillopora* sp., 8.6.1995, coll. P. CASTRO & R. SPRINGTHORPE : 1 ♂, 1 ♀ (AM P44628, photographed).

Middleton Reef. Site 2 C, reef flat, *Runic*, 29°28.5'E, 159°03.7'S, 4.12.1987, coll. R. SPRINGTHORPE : 1 ♂, 1 ♀ (AM P38230).

Elizabeth Reef. Site 39 A, reef flat, 13.12.1987, coll. R. SPRINGTHORPE : 4 ♂, 3 ♀ (AM P38231). — Site 43, reef flat near *Yoshida Maru Iwaki* wreck, 29°55.8'S, 159°01.3'E, on *Acropora valida*, *Pocillopora damicornis* & *Stylophora pistillata*, 14.12.1987, coll. J. LOWRY : 5 ♂, 10 ♀ (AM P38229).

Lord Howe I. 4.1932, coll. A. A. LIVINGTONE : 3 ♂, 1 ♀ (AM P10307). — 31°33'S, 159°05'E, on *Pocillopora* sp., 2.1973, Australian Museum Party : 1 ♂, 1 ♀ (AM P20112). — Erscott's Hole, 31°33'S, 159°05'E, 13.12.1979, coll. N. COLEMAN : 1 ♂, 1 ♀ (AM P 38883).

Norfolk I. Emily Bay, 29°05'S, 167°57'E, on *Pocillopora*, 20.3.1969, coll. D. GRIFFIN : 1 ♀ (AM P17308). — Off Kingston Wharf, 29°04'S, 167°57'E, 0.5 m, 1981, coll. T. CHURCH : 1 ♀ (AM P32234).

COLOR. — Carapace and chelipeds covered with a network of interconnected red-brown lines, mostly in the form of pentagons and hexagons, on a cream to pink background (pls 2 E & 6). Legs are bright orange, darker at the tips. Lower portion of the cheliped propodus is orange ; fingers brown. Eyes are dark gray. The honeycomb pattern on the carapace and chelipeds remains preserved for decades.

Color photographs of *T. septata* were given by HEALY & YALDWYN (1970), MIYAKE (1983), NAGAI & NOMURA (1988), JONES & MORGAN (1994), and TAKEDA (1994).

REMARKS. — GALIL & LEWINSOHN (1985b) established the identity of *T. septata* as a species different from *T. areolata* Dana. Both species were redescribed and differences confirmed.

T. septata and *T. guttata* are the most common small-size species of *Trapezia* in the Coral Sea region. Preserved specimens of both species are easily separated as long as their diagnostic color pattern remains. *T. septata* can nevertheless be distinguished morphologically from *T. guttata* by having thicker chelipeds that lack the long and slender fingers of *T. guttata*, rounder anterolateral portion of the carapace, mostly obtuse epibranchial teeth, and acute postorbital angles that do not project outward as in *T. guttata.*

T. septata has been recorded throughout most of the Indo-west Pacific region (GALIL, 1988b and GALIL & CLARK, 1990). It is absent from the Hawaiian Islands. Records from Easter Island (GARTH, 1973) and French Polynesia are most probably misidentied *T. areolata* Dana, which also features a honeycomb pattern on the carapace and chelipeds (CASTRO, 1997).

Trapezia serenei Odinetz, 1984
Pl. 2 F

Trapezia serenei Odinetz, 1983 : 34, photograph 6 (color) ; 1984 : 440, figs 3 B, 3b, 4 B. — ALLEN & STEENE, 1994 : 159 (color photograph).
Trapezia ferruginea – JONES & MORGAN, 1994 : 178 (color photograph).

MATERIAL EXAMINED. — **Guam.** 1-3 m, on *Pocillopora damicornis*, 1981 : 1 ♂ holotype (MNHP-B 9681).

New Caledonia. Renaurd I., 26.7.1986 : 1 ♀ (MNHN-B 25098). — LAGON, north lagoon : st. DW 1189, 19°32.10'S, 163°34.20'E, 20 m, 1.11.1989 : 1 ♀ (MNHN-B 25099).

Chesterfield Is. CORAIL 2 : st. DW 85, 19°12.85'S, 158°56.26'E, 32 m, 26.8.1988 : 1 ♂, 1 ♀ (MNHN-B 25102). — St. DW 92, 19°03.0'S, 158°53.93'E, 8 m, 26.8.1988 : 3 ♂, 3 ♀ (MNHN-B 25103).

Flinder Reefs. 26°59'S, 159°29'E, 6-20 m, 10.3.1989, coll. P. DAVIE, J. SHORT, & P. LAWLESS : 1 ♀ (QM W16228).

Middleton Reef. Reef outside lagoon, 7.5.1987, coll. J. SHORT : 1 ♀ (QM W1980).

Elizabeth Reef. Lagoon, 4.5.1987, coll. J. SHORT : 1 ♂, 1 ♀ (QM W12984)

Western Australia. Kendrew I., Dampier Archipelago, 20.5.1974, Crown-of-Thorns Survey : 2 ♂, 2 ♀ (WAM 504-86).

Philippine Islands. MUSORSTOM 2 : Cebu, 12.1981 : 1 ♂, 1 ♀ (MNHN-B 9686).

French Polynesia. Material collected and identified by O. ODINETZ : Moorea, barrier reef, on *Pocillopora elegans*, 1982 : 1 ♂, 1 ♀ (MNHN-B 9688). — Moorea, barrier reef, on *Pocillopora elegans*, 1982 : 1 ♂, 1 ♀ (MNHN-B 9753). — Moorea, on *Pocillopora damicornis*, 1982 : 1 ♂, 1 ♀ (MNHN-B 9689). — Tahiti, on *Pocillopora elegans*, 1982 : 1 ♂, 1 ♀ (MNHN-B 9690). — Takapoto, on *Pocillopora* sp., 1982 : 1 ♂, 1 ♀ (MNHN-B 9693). — Takapoto, on *Pocillopora elegans*, 1982 : 1 ♂, 1 ♀ (MNHN-B 9694). — Takapoto, on *Pocillopora elegans*, 1982 : 1 ♂, 1 ♀ (MNHN-B 9695). — Takapoto, on *Pocillopora elegans*, 1982 : 1 ♂, 1 ♀ (MNHN-B 9752).

French Polynesia. Iaorana, Tahiti, on *Pocillopora damicornis*, 10.1994, coll. J. POUPIN : 1 ♂, 1 ♀ (MNHN-B 25193, photographed).

COLOR. — No live specimens of *T. serenei* were obtained during the course of this investigation. Color photographs of live material (ALLEN & STEENE, 1994 and, as *T. ferruginea*, NAGAI & NOMURA, 1988 and JONES & MORGAN, 1994), however, clearly show the diagnostic color of the species. The carapace is orange-

pink with pink or purplish edges, chelipeds are pinkish orange with the edges of the segments pink. The walking legs are pink. A photograph referred to as *T. ferruginea* by TAKEDA (1994) is probably *T. serenei* (pl. 2 F).

Preserved specimens will keep a pink or light purplish color along the anterior edges of the carapace and the merus and carpus of the chelipeds. A pink color can also be detected on the lower surface of the walking legs and on the abdomen, particularly in females.

REMARKS. — This species was originally caracterized in a doctoral dissertation of limited distribution (ODINETZ, 1983) and therefore the description should not be considered valid. A subsequent publication (ODINETZ, 1984) formally described the species. ODINETZ (1984) suggested from color descriptions that earlier records of *T. cymodoce* from New Caledonia (A. MILNE EDWARDS, 1873) and *T. ferruginea* from Australia (PATTON, 1966) and French Polynesia (KROPP & BIRKELAND, 1982) were actually *T. serenei.*

The most reliable method of identifying preserved specimens of *T. serenei* is by observing the characteristic pink or purplish color that can be detected along the edges of the carapace and segments of the chelipeds. Preserved specimens may be confused with *T. cymodoce* and *T. lutea.* Morphological features that characterize *T. cymodoce* (acute epibranchial teeth, a complete suture between the second and third thoracic somites, and an often acute tooth on the anterior distal margin of carpus of chelipeds) can also be found in small specimens of *T. serenei.* Nevertheless, in contrast to *T. cymodoce*, *T. serenei* lacks a tomentum, the anterior portion of the carapace is rounded, and in adults the inner suborbital teeth are relatively short and subacute. There are four to five transversal rows of setae on the inner margin of the last walking leg, in contrast to six to eight in *T. cymodoce.*

Of the 25 specimens of *T. serenei* examined, 14 had acute epibranchial teeth and 11 had blunt teeth (including three small specimens) ; 17 had a thoracic suture while it was absent in eight. In *T. serenei*, however, there is no tomentum on the chelipeds and there are no rows of reddish dots on the dorsal surface of the carapace. In many preserved specimens the carapace and chelipeds are noticeably paler than in *T. cymodoce. T. serenei* shares with *T. ferruginea* the absence of a conspicuous tomentum and, in large specimens, blunt epibranchial teeth, no thoracic suture, relatively short inner suborbital teeth, and a similar number of transversal rows of setae on the last pair of walking legs (four to five in contrast to five to six in *T. ferruginea*).

In addition to the French Polynesia, Philippine Islands, and Guam records of ODINETZ (1984), *T. serenei* is recorded here for the first time from several Coral Sea locations and from Western Australia. Photographs of specimens from Okinawa (NAGAI & NOMURA, 1988) and an unknown location (ALLEN & STEENE, 1994) confirms a much wider distribution.

CONCLUSIONS

The examination of extensive live and preserved trapeziids from the Coral Sea underscores the critical importance of color in their taxonomy. This is especially evident in the case of species of *Trapezia* and *Tetralia.* Color rather than morphology best characterizes these mostly sympatric species. Very small morphological differences have remained unrecognized by specialists who have worked with preserved material. This investigation stresses the need of recognizing differences in the color pattern of live specimens of *Trapezia* and *Tetralia* before attempting the identification of preserved specimens. Nevertheless, morphology still must be used in preserved specimens where color patterns are no longer apparent. Assemblages of morphologically close species such as some of these trapeziids are known as sibling species (KNOWLTON, 1986, 1993 ; CASTRO, 1996).

A better understanding of the systematics of trapeziids will permit investigating their geographical distribution. Species such as *Trapezia cymodoce, T. digitalis,* and *T. ferruginea* have a very wide distribution, where as others such as *T. areolata, T. bella, T. corallina,* and *T. punctipes* seemingly have a limited distribution (CASTRO, 1997). Host specificity, the geographical distribution of hosts, and larval development should present some clues.

Other species of trapeziids undoubtedly remain to be reported from the Coral Sea region. Such is the case of species of *Jonesius* Sankarankutty and *Palmyria* Galil & Takeda, which have been included in the family Trapeziidae (SERÈNE, 1984 ; GALIL & TAKEDA, 1986). A total of two species are included in the genera. Both are associated with scleractinian corals. *Domecia* Eydoux & Souleyet, which is sometimes included in the

Trapeziidae (SERÈNE, 1984 ; GALIL & VANNINI, 1990), has been previously recorded from the Coral Sea (PATTON, 1966, 1974, 1994). The genus consists of two species associated with scleractinian corals. Its systematic position, however, needs to be clarified.

KEY TO THE CORAL SEA TRAPEZIIDS

1. Carapace with distinctly octagonal or hexagonal outline, its posterior margin wider or as wide as anterior margin. On gorgonians, antipatharians, alcyonaceans, or ahermatypic corals **2**

— Carapace trapezoidal or oval, its posterior margin shorter than anterior margin. On hermatypic corals **3**

2. Carapace octagonal and clearly wider than long ; anterior margin devoid of conspicuous teeth. Deep water (usually more than 300 m) ..... ***Calocarcinus africanus***

— Carapace hexagonal and only slightly wider than long ; anterior margin with conspicuous triangular, teeth-like lobes. In water usually shallower than 150 m .....

..... ***Quadrella maculosa***

3. Anterior margin of carapace with small teeth and no distinctive lobes. Chelipeds very dissimilar in size. Male abdomen with seven segments. On acroporid corals (*Acropora*).. **4**

— Anterior margin of carapace with four rounded lobes.Chelipeds massive and only slightly dissimilar in size. Male abdomen with five segments. Almost exclusively on pocilloporid corals (*Pocillopora, Seriatopora, Stylophora*) ..... ***Trapezia*** **9**

4. Largest cheliped with setae-filled depression on dorsal, proximal surface. Thoracic sternum with median vertical suture ..... ***Tetralia*** **5**

— Largest cheliped without setae-filled depression on dorsal surface. Thoracic sternum without median suture ..... ***Tetraloides*** **8**

5. Chelipeds with many heavy granules. Endopod of first maxilliped with slightly concave distal edge. Walking legs light tan with proximal portions of segments banded brown .....

..... ***Tetralia cinctipes***

— Chelipeds smooth or with microscopic granules. Endopod of first maxilliped with straight or slightly convex edge. Walking legs not distinctively banded **6**

6. Cheliped merus with very prominent dentate crest. Endopod of first maxilliped with rectangular anterior edges, having both external and internal anterior edges at nearly right angles. Distal portion of cheliped dactylus distinctively orange red ; distal border of cheliped merus and carpus dark brown ..... ***Tetralia rubridactyla***

— Cheliped merus with shallow crest or no crest at all. Endopod of first maxilliped with one or both anterior edges rounded. Cheliped dactylus not conspicuously colored ; no dark-brown bands on merus or carpus **7**

7. Endopod of first maxilliped with rectangular inner anterior edge and rounded outer edge. Posterolateral sides of carapace usually straight. Thin orange to orange-red line along anterior border of carapace, faint gray band along anterolateral borders ..... ***Tetralia fulva***

— Endopod of first maxilliped with inner and outer anterior edges rounded. Posterolateral sides of carapace rounded. Conspicuous dark band along anterior and anterolateral borders of carapace ..... ***Tetralia nigrolineata***

8. Small cheliped with triangular, teeth-like tubercles along lower margin. Carapace light

brown ; walking legs light brown with dark-brown spots ..... ***Tetraloides heterodactyla***

— Small cheliped with rounded tubercles along lower margin. Carapace dark brown anteriorly, cream posteriorly ; walking legs dark brown with cream spots ..... ***Tetraloides nigrifrons***

9. Upper and outer border of chelipeds with conspicuous tomentum that consists of many long setae ; cheliped propodus with keel-like (subacute) upper edge **10**

— Upper border of chelipeds without tomentum along entire length, though microscopic or visible setae may be present along proximal segments ; cheliped propodus with rounded upper edge **11**

10. Conspicuous suture between second and third thoracic sternites always present. Carapace with almost straight anterolateral borders ; epibranchial teeth acute except in largest individuals. Carapace purplish to brownish blue, with row of orange-red spots across dorsal surface ..... ***Trapezia cymodoce***

— Suture between second and third thoracic sternite present only in smaller individuals, partially or completely fused in larger ones. Carapace with rounded anterolateral borders ; epibranchial teeth acute in smaller individuals, obtuse in larger ones. Carapace orange ..... ***Trapezia lutea*** **new species**

11. Dorsal surface of carapace of live individuals or recently preserved specimens without colored spots, dots, bands or lines, other than a very thin line along anterior border of carapace or distinctive band in postlarvae and juveniles **12**

— Dorsal surface of carapace ornamented with distinctive colored spots, dots, bands, or lines that very often remain in preserved specimens (if anterior border of carapace is colored differently from rest of carapace, it is as a broad band, not a very thin line) **16**

12. Carapace and chelipeds dark brown in color, which remains in preserved specimens (broad cream band may be present across carapace in postlarvae and juveniles). Frontal border of carapace with slight emarginations and minute teeth ..... ***Trapezia digitalis***

— Carapace orange or orange-pink. Frontal border of carapace with well demarcated emarginations and no visible teeth (microscopic in some individuals) **13**

13. Carapace with anterolateral borders strongly curved (inclination up to 45°, giving carapace rounded or globose appearance) ..... ***Trapezia formosa***

— Carapace with anterolateral borders only slightly rounded **14**

14. Walking legs bright orange with numerous orange-red dots on anterior and posterior sides. Orange-red dots also on ventral somites and usually on abdomen ..... ***Trapezia punctipes*** **new species**

— Walking legs, ventral somites, and abdomen without colored dots (an orange-red spot may be present on each walking leg) **15**

15. Carapace orange or brown orange with very thin, lighter orange edges. Orange-red spot on distal end of propodus of walking legs. Suture between second and third thoracic somites present only in very small specimens ..... ***Trapezia ferruginea***

— Carapace orange-pink with conspicuous pink or purplish edges. No spots on walking legs. Suture between second and third somatic somite present except in larger specimens ..... ***Trapezia serenei***

16. Inner margin of cheliped propodus armed with thick, teeth-like tubercles. Dorsal surface of carapace with colored spots **17**

— Inner margin of cheliped propodus smooth or with microscopic tubercles. Dorsal surface of carapace without spots **18**

17. Frontal teeth rounded. Dorsal surface of carapace red with large yellow spots .....
..... ***Trapezia flavopunctata***

— Frontal teeth triangular. Dorsal surface of carapace cream with red spots .....
..... ***Trapezia rufopunctata***

18. Dorsal surface of carapace white to cream, with a brown band across frontal border between eyes. Walking legs with brown-red spots. Chelipeds slender, with long and slender fingers that extend well over tips when closed ..... ***Trapezia guttata***

— Dorsal surface of carapace with honeycomb-like network of red-brown lines interconnected as pentagons or hexagons on cream to pink background. Walking legs without spots. Chelipeds thick ..... ***Trapezia septata***

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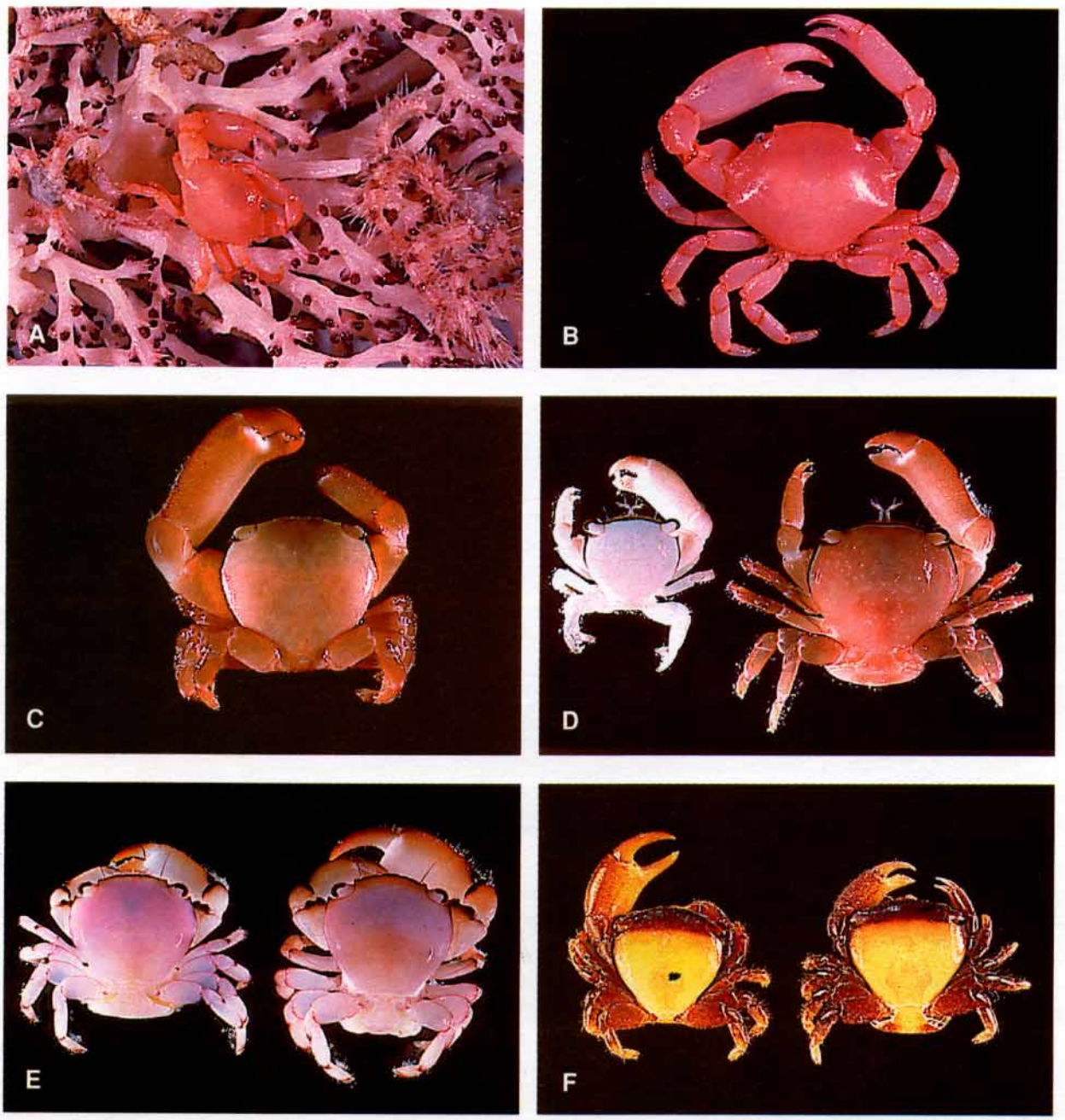
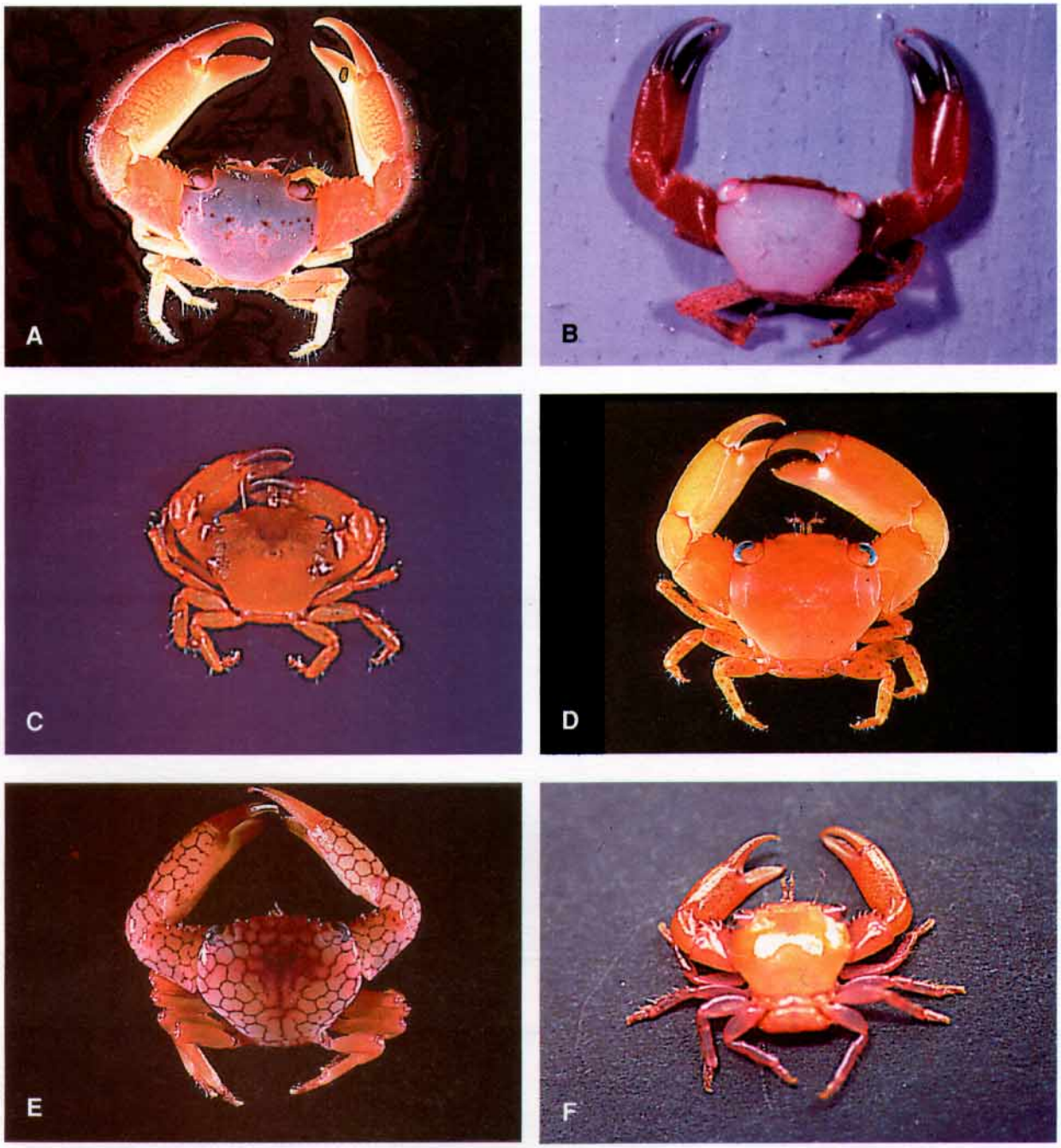
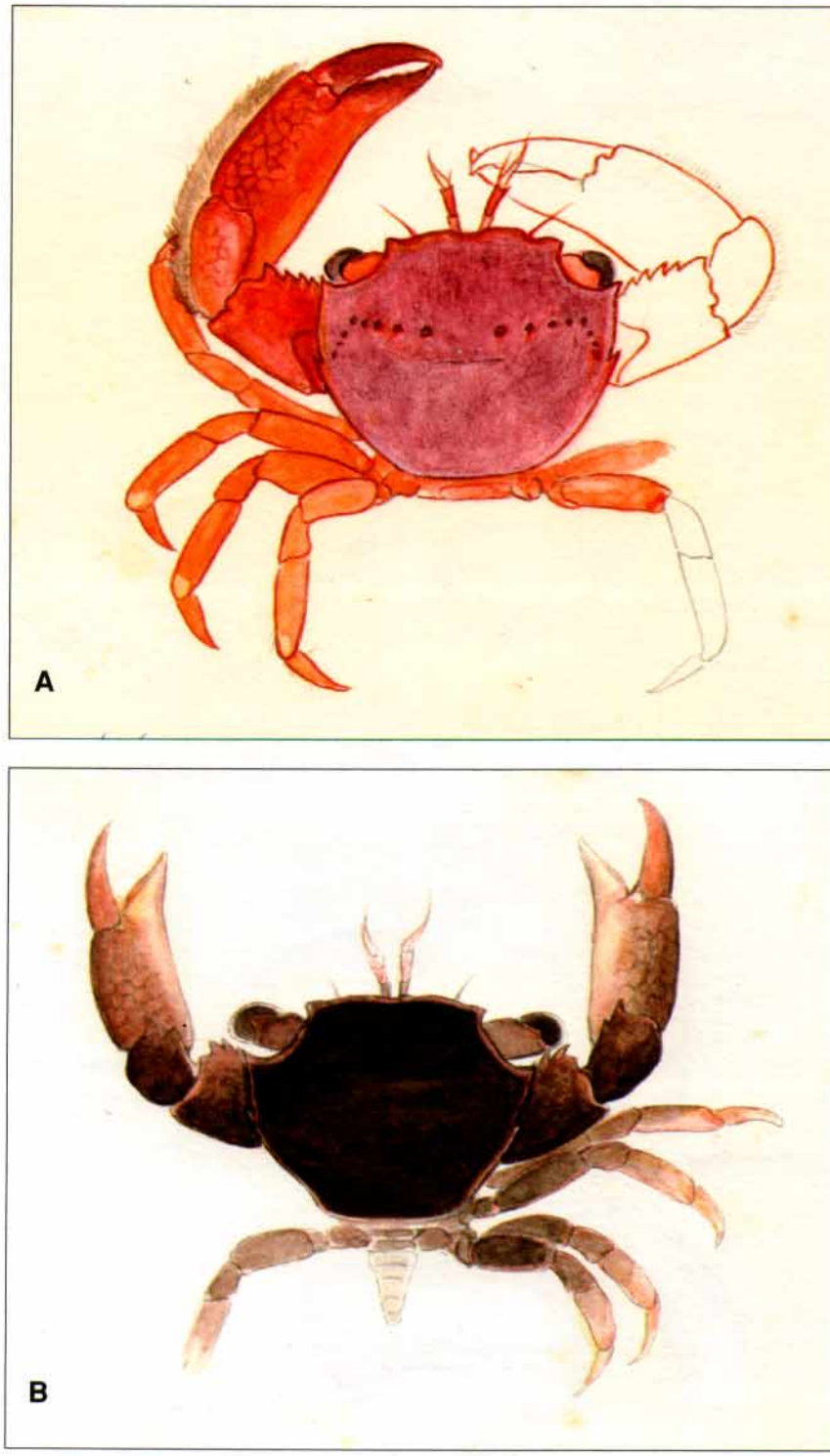


Pl. 1. — **A** : *Calocarcinus africanus* (Calman, 1909). Live male (MNHN-B 25221) dredged on its host, an alcyonacean (*Siphonogorgia* sp.), Loyalty Is., New Caledonia. (Photograph by P. LABOUTE, ORSTOM). **B** : *Calocarcinus africanus* (Calman, 1909). Live male (MNHN-B 25221), Loyalty Is., New Caledonia. (Photograph by P. LABOUTE, ORSTOM). **C** : *Tetralia fulva* Serène, 1984. Live male (AM P44626), Lizard I., Queensland, Australia. (Photograph by R. SPRINGTHORPE, AM). **D** : *Tetralia nigrolineata* Serène & Dat, 1957. Live male & female (AM P44620), Lizard I., Queensland, Australia. (Photograph by R. SPRINGTHORPE, AM). **E** : *Tetralia rubridactyla* Serène, 1984. Live male & female (AM P44617), Lizard I., Queensland, Australia. (Photograph by R. SPRINGTHORPE, AM). **F** : *Tetraloides nigrifrons* (Dana, 1852). Preserved male & female (MNHN-B 25186), Chesterfield Is. (Photograph by J. REBIÈRE, MNHN).

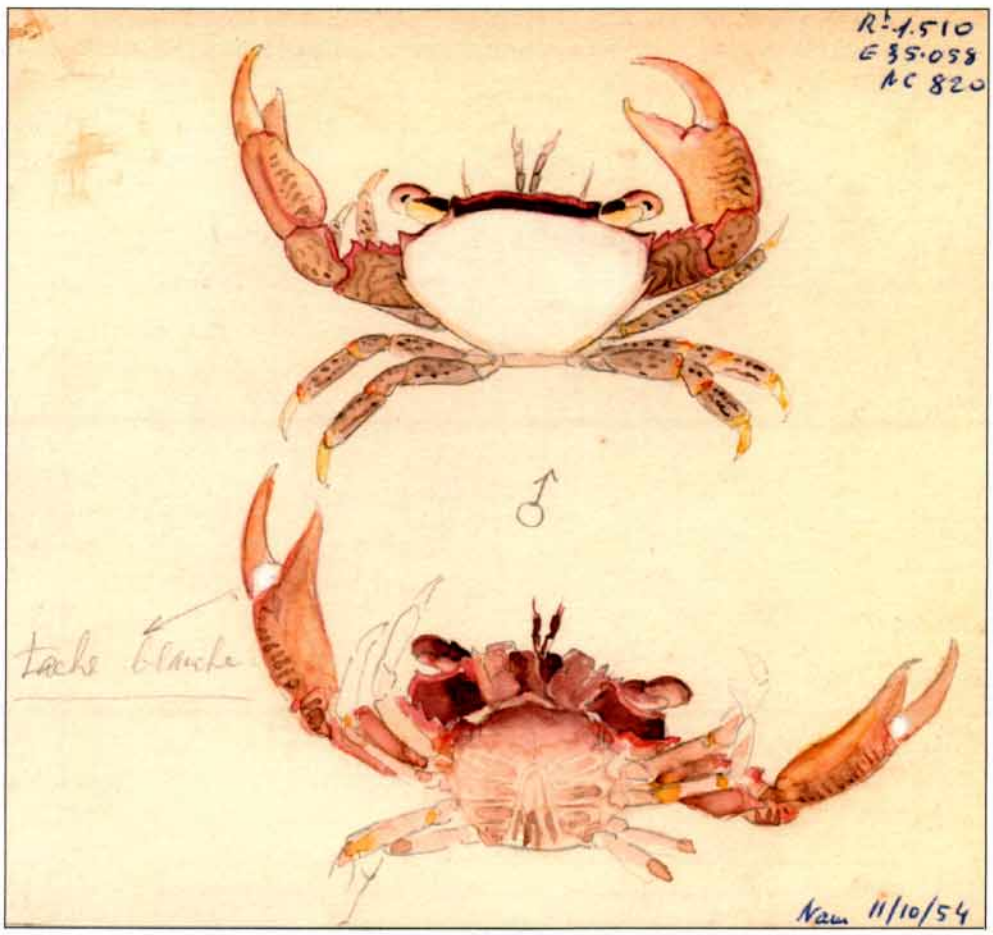


Pl. 2. — **A** : *Trapezia cymodoce* (Herbst, 1801). Live male (AM P 44622), Lizard I., Queensland, Australia. (Photograph by R. SPRINGTHORPE, AM). **B** : *Trapezia guttata* Rüppell, 1830. Live male (MNHN-B 25008), New Caledonia. (Photograph by J. -L. MENOU, ORSTOM). **C** : *Trapezia lutea* sp. nov. Live male holotype (MNHN-B 25222), New Caledonia. (Photograph by P. CASTRO for ORSTOM). **D** : *Trapezia punctipes* sp. nov. Live female paratype (AM P44627), Lizard I., Queensland, Australia. (Photograph by R. SPRINGTHORPE, AM). **E** : *Trapezia septata* Dana, 1852. Live female (AM P44628), Lizard I., Queensland, Australia. (Photograph by R. SPRINGTHORPE, AM). **F** : *Trapezia serenei* Odinetz, 1984. Live female (MNHN-B 25193), Tahiti. (Photograph by J. POUPIN).

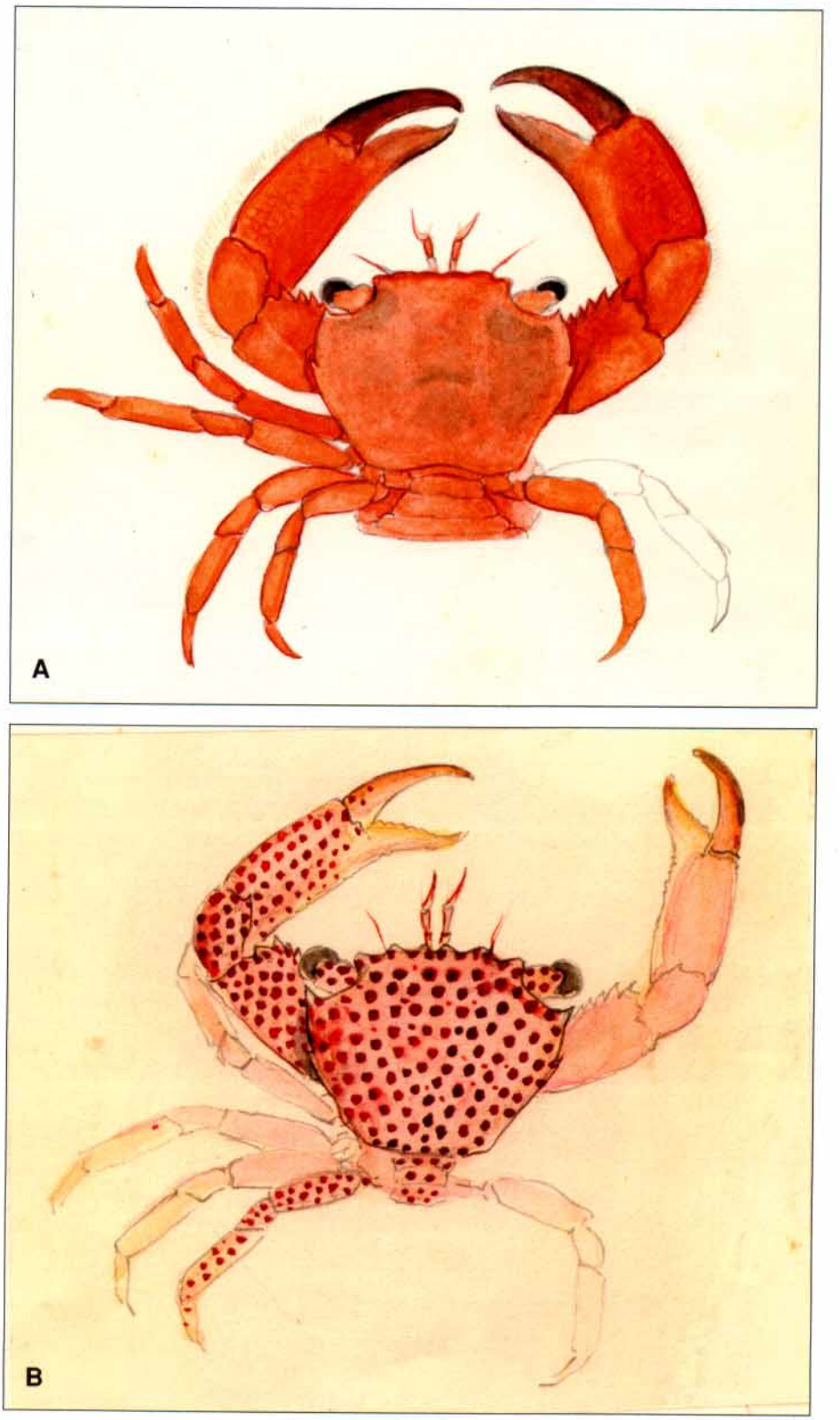
Pls 3-6. — Original watercolors made by Trinh VAN NAM for Raoul SERÈNE at the Institut Océanographique, Nhatrang, Viet Nam between 1954 and 1956 (notes and documents on the Trapeziidae, R. SERÈNE, ORSTOM, Paris).



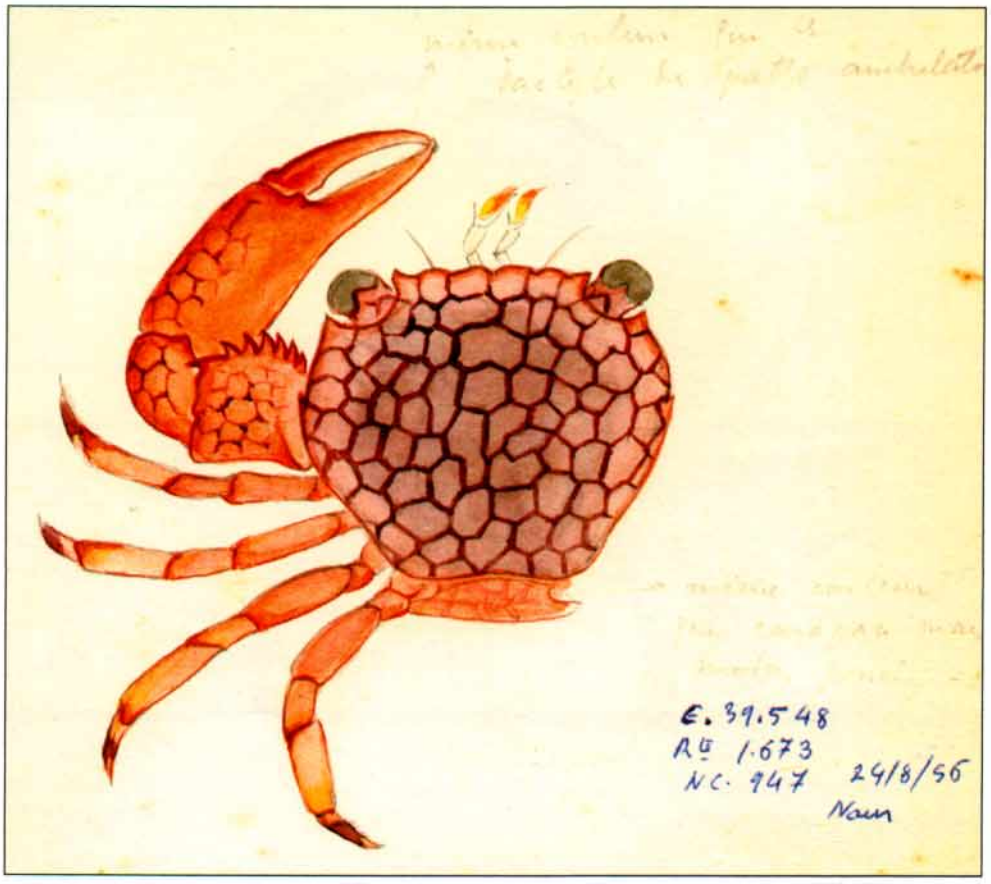
Pl. 3. — **A** : *Trapezia cymodoce* (Herbst, 1801) as *T. cymodoce* var. *rosea*. **B** : *Trapezia digitalis* Latreille, 1828.

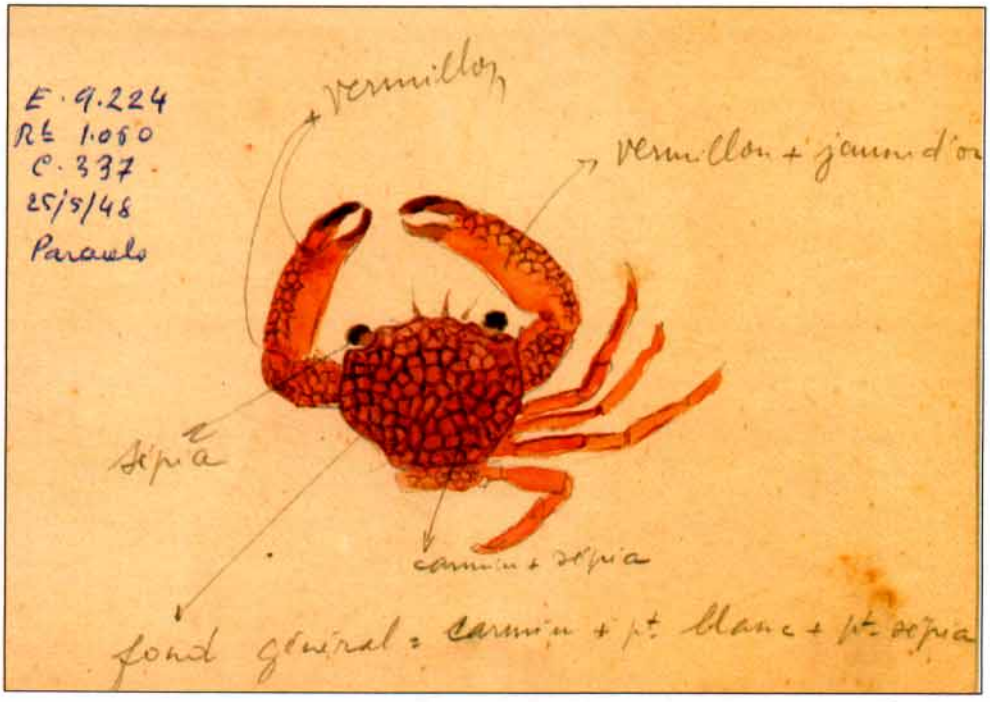


Pl. 4. — *Trapezia guttata* Rüppell, 1830.



Pl. 5. — **A** : *Trapezia lutea* sp. nov. as *T. cymodoce* var. *lutea*. **B** : *Trapezia rufopunctata* (Herbst, 1799).





Pl. 6. — *Trapezia septata* Dana, 1852.

Pl. 7. — **A** : *Quadrella coronata* Dana, 1852. Live female (MNHN-B 25765). **B** : *Quadrella maculosa* Alcock, 1898. Live female (MNHN-B 25766). (Photographs by J. -L. MENOU).