

Status of the genera *Macroposthonia*, *Criconemoides*, *Criconemella* and *Xenocriconemella* (Criconematidae : Nematoda)

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SUMMARY

Critical examination of the original data concerning *Macroposthonia annulata*, *Criconemoides kirjanovae*, *C. morgensis* and *C. pseudohercyniensis* led the authors to the following conclusions : (i) *Macroposthonia annulata* De Man, 1880, type species of the genus, cannot be considered a major synonym of *Criconemoides kirjanovae* Andrassy, 1962, as proposed by De Grisse and Loof (1965), and consequently the latter is restored as a valid species. *Macroposthonia annulata* is assigned the status of *genus et species dubia*. *M. annulata apud* Kischke, 1956 is not conspecific with *Nothocriconema annuliferum* and is considered as *species indeterminata*. (ii) *Criconemoides morgensis* (Hofmänner in Hofmänner & Menzel, 1914) Taylor, 1936, type species of the genus *Criconemoides* Taylor, 1936, cannot be considered a major synonym of *C. pseudohercyniensis* De Grisse & Koen, 1964, as proposed by Loof and De Grisse (1967), and consequently the latter is restored as a valid species. *C. morgensis* is assigned the status of *species dubia*. As a consequence of this action the genus *Criconemoides* itself should be considered a *genus dubium*.

Examination of the characters of the genera *Criconemella* De Grisse & Loof, 1965, and *Xenocriconemella* De Grisse & Loof, 1965, has shown that there are not sufficient differences between the species pertaining to these genera and those species presently attributed to *Macroposthonia* and to *Criconemoides* to justify separate genera.

Consequently all the species ordered in *Macroposthonia*, *Criconemoides*, *Criconemella* and *Xenocriconemella* are considered to pertain to a unique genus, for which, following the rule of priority, the name of *Criconemella* is retained. An amended diagnosis of *Criconemella* is provided. The synonymies with *Mesocriconema* Andrassy, 1965 (*p. parte*), *Neocriconema* Diab & Jenkins, 1965, and *Madinema* Khan, Chawla & Saha, 1976 (*p. parte*) are confirmed.

A list of the valid species of *Criconemella* (with synonyms) is given, as well as a list of *species inquirendae vel dubiae* attributed to the genus *Criconemoides*.

RÉSUMÉ

Statut des genres Macroposthonia, Criconemoides, Criconemella et Xenocriconemella (Criconematidae : Nematoda)

L'examen critique des données originales concernant *Macroposthonia annulata*, *Criconemoides kirjanovae*, *C. morgensis* et *C. pseudohercyniensis* conduit les auteurs aux conclusions suivantes : (a) *Macroposthonia annulata* De Man, 1880, espèce type du genre, ne peut être considérée comme un synonyme majeur de *Criconemoides kirjanovae* Andrassy, 1962, ainsi que l'ont proposé De Grisse & Loof (1965) ; en conséquence cette dernière espèce est reconnue valide. *M. annulata* est considéré comme *genus et species dubia*. *M. annulata apud* Kischke (1956) n'est pas identique à *Nothocriconema annuliferum* et doit être classé parmi ces *species indeterminatae*. (b) *Criconemoides morgensis* (Hofmänner in Hofmänner & Menzel, 1914) Taylor, 1936, espèce type du genre *Criconemoides* Taylor, 1936, ne peut être considéré comme un synonyme majeur de *C. pseudohercyniensis* De Grisse & Koen, 1964, ainsi que l'ont proposé Loof et De Grisse (1967) ; en conséquence cette dernière espèce est reconnue valide. Par suite de cette action, le genre *Criconemoides* lui-même doit être considéré comme *genus dubium*.

L'examen des genres *Criconemella* De Grisse & Loof, 1965 et *Xenocriconemella* De Grisse & Loof, 1965, a montré qu'il n'existait pas de différences suffisantes entre les espèces appartenant à ces deux genres et celles précédemment attribuées à *Macroposthonia* et *Criconemoides* pour justifier des genres distincts.

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En conséquence, toutes les espèces rangées dans les genres *Macroposthonia*, *Criconemoides*, *Criconemella* et *Xenocriconemella* sont considérées comme appartenant à un genre unique, pour lequel le nom de *Criconemella* doit être retenu. Une diagnose amendée du genre *Criconemella* est définie, et les synonymies avec les genres *Mesocriconema* Andrassy, 1965 (*p. parte*), *Neocriconema* Diab & Jenkins, 1965 et *Madinema* Khan, Chawla & Saha, 1976 (*p. parte*) sont confirmées.

Une liste des espèces valides du genre *Criconemella* (avec les synonymies) est donnée, de même qu'une liste de *species inquirendae vel dubiae* attribuées au genre *Criconemoides*.

During the last two decades, a great attention has been afforded by taxonomists to the Criconematids. Among the published works, those of De Grisse often in cooperation with Loof, merit a special mention by the new light they afforded in this difficult group.

Nevertheless some points of this work appear open to criticism, as these ones that are the subject of the present publication.

Proposals by De Grisse and Loof (1965) and Loof and De Grisse (1967, 1973) have been advanced as an attempt to add stability to the taxonomy of Criconematidae by designating certain nematode specimens as types of *Macroposthonia* De Man, 1880 and *Criconemoides* Taylor, 1936. At the present time no type specimens of either the types species, *M. annulata* and *C. morgensis*, are extant. Admittedly the establishment of such types would be of great value in eliminating uncertainties as to exact definitions of those genera. However there are important doubts that the specimen to be considered as type, by synonymization, for *M. annulata* is conspecific with the described species. The same doubts exist concerning the conspecificity of the specimen designated as neotype with the original description of *C. morgensis*. The convenience of having types so designated cannot be sufficient justification for the actions and alternative decisions must be taken.

The evidence that follows is more in keeping with the facts and is presented to support the alternative which we propose.

Status of *Macroposthonia annulata* De Man, 1880

Macroposthonia annulata De Man, 1880 was described from male specimens collected from moist soils in meadow and marshlands in the

Netherlands. No type locality was given in the original publication, but in a subsequent paper De Man (1921) stated more precisely that the type specimens (« exemplaires typiques ») had been discovered at Leyden. In the description-diagnosis of the genus (see Fig. 1), De Man (1880) underlined two points : the absence of a buccal cavity and the fact that the tail is entirely surrounded by a wide bursa. No illustration accompanied this description, such an illustration (Fig. 2 A-D) appeared later (De Man, 1884).

M. annulata was found again according to De Man (1921) who described a unique male recorded from the Liebosch Forest, near Breda (Netherlands). De Man (1921) himself emphasized the differences between this male and the type specimens concerning the body length (0.326 mm vs 0.510 mm) ; moreover illustrations of the anterior end in both cases show important differences : in the type specimens (Fig. 2 A) the anterior part is conical and ends abruptly, the lip area being truncate ; in the 1921 (Fig. 2 E) specimen, the anterior end tapers smoothly and with a rounded outline. Thus doubt remains whether De Man was dealing with the same species on both occasions.

The only other record of *M. annulata* as such is that of Kischke (1956) (Fig. 2 F, G). But there is no doubt the author was dealing with males of a different (possibly third ?) species : the annulations nearly reach the lip area (compare Fig. 2 G, with Figs 2 A & E) and the spicules and tail are longer (Table 1).

The status of *M. annulata* remained controversial for a long time due mainly to the question of the bursa. Filipjev (1936) stated that a « true bursa [is] apparently absent » and considered that *M. annulata* represents a male of *Paratylenchus*, probably *P. bukowinensis* Micoletzky, 1922. Thorne (1949) agreed with Filipjev (1936) and considered *M. annulata* a Paratylenchinae

XXVII. MACROPOSTHONIA nov. gen.

(von μακρός, gross und πέσθη, Glied).

Körper von plumper Gestalt, geringelt, mit Seitenmembran. Kopfende nicht abgesetzt, ohne Lippen, Papillen oder Borsten. *Mundhöhle fehlend*. Oesophagus und Darm undeutlich umgrenzt, der letztere bisweilen mit zahlreichen Fettkörnchen ausgefüllt. Geässporus beim Beginn des Darmes gelegen. Schwanz beim Männchen ganz von einer breiten Bursa umfasst, worauf die Ringelung der Haut sich fortsetzt; diese Bursa ohne Papille. Spicula schlank und relativ sehr gross, ohne accessorische Stücke. Schwanzdrüse fehlend. Weibchen unbekannt.

83. *Macroposthonia annulata* n. sp.

♂ 0,51 mm. $\alpha = 19-22$. $\beta = 4-4\frac{1}{2}$. $\gamma = 10-14$.

Körper von *plumper* Gestalt, Vorderende mässig verjüngt. Ringe der Haut sehr *breit*. Seitenmembran ziemlich schmal. Oesophagus wahrscheinlich cylindrisch, ohne Erweiterungen und undeutlich umgrenzt. Vorderende mässig zugespitzt, mit einem vorderen sehr kleinen, etwas abgesetzten, scheibförmigen Theile. Schwanz kurz, kegelförmig, ganz von der Bursa umfasst. *Spicula sehr schlank, so lang wie der Schwanz*. Gleich bei und hinter dem After eine grosse mediane Papille, worüber hin die Spicula gleiten.

Ein sehr seltenes Thierchen, ein Bewohner der feuchten, von süssem Wasser getränkten Erde unserer Wiesen und Marschgründe. Bewegung ziemlich lebhaft.

Fig. 1. Facsimile of the original descriptions of *Macroposthonia* and *M. annulata* (from De Man, 1880). [Translation: XXVII *Macroposthonia* nov. gen. (μακρός, big and πέσθη, penis).] Body looking stout, annulated, with lateral field. Head end not set off, without lips, papillae or setae. Buccal cavity absent. Oesophago-intestinal limit indistinct; intestine sometimes full of lipidic granules. Excretory pore located at the level of the beginning of the intestine. Tail of the male entirely surrounded by a wide bursa on which the cuticular annulation continues; this bursa without papillae; spicules slender, relatively long, without accessory pieces. Caudal glands absent. Female unknown.

83. *Macroposthonia annulata* n. sp.

♂ 0.51 mm; $\alpha = 19-22$; $\beta = 4-4\frac{1}{2}$; $\gamma = 10-14$.

Body stout, anterior part moderately narrowing. Cuticular annules very large. Lateral field relatively narrow. Oesophagus apparently cylindrical, without enlargement and with an indistinct posterior limit. Anterior part rather attenuated, with an anterior end very small, somewhat set off and disc-shaped. Tail short, conical entirely surrounded by the bursa. Spicules very slender having the same length as the tail. Very close and posterior to the cloaca a big median papilla on which the spicules glide.

A very rare animal, an inhabitant of the humid, fresh water-saturated soils of our grassland and marshy valleys. Movements rather lively.

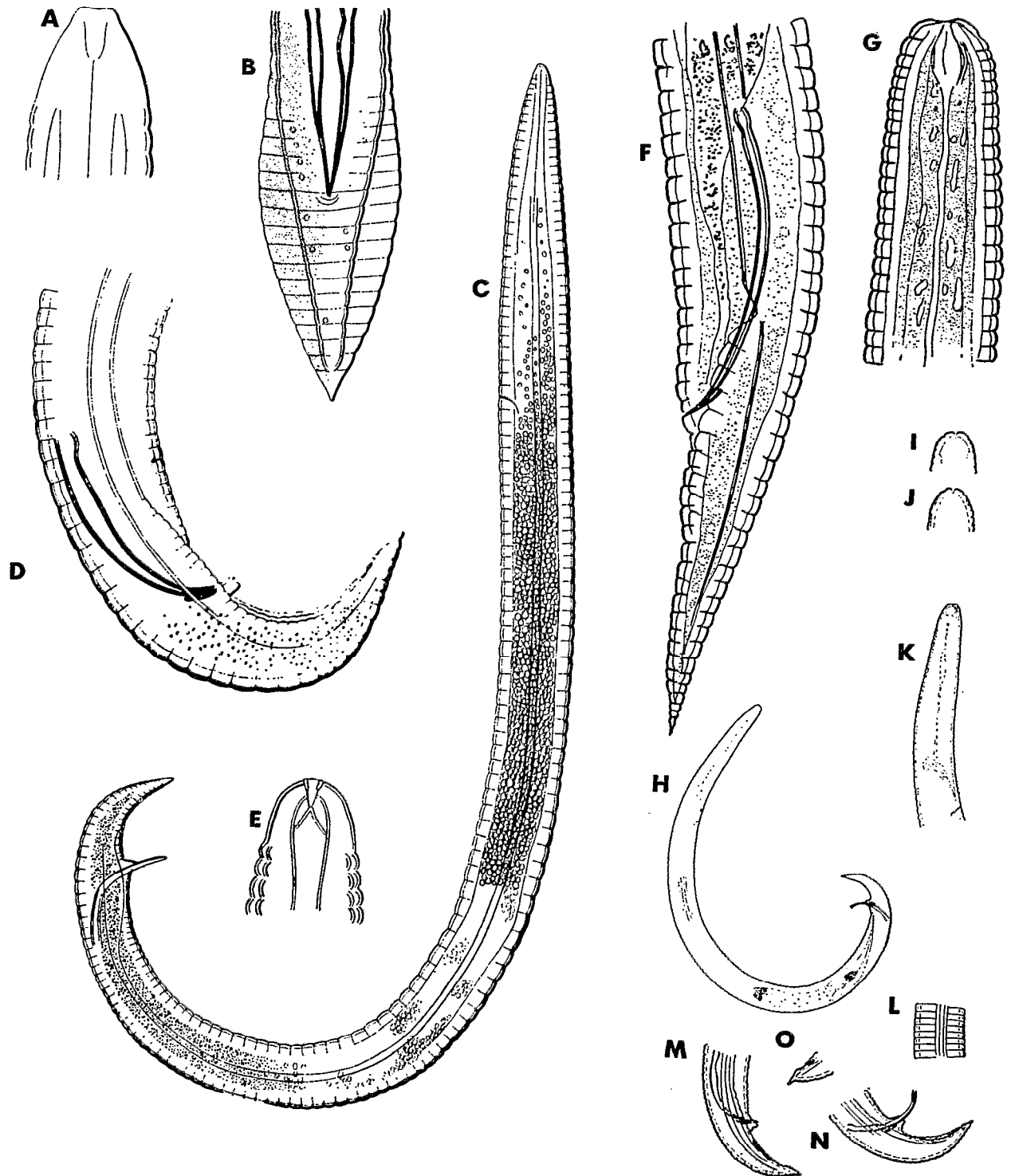


Fig. 2. "*Macroposthonia annulata*" original illustrations by various authors. De Man (1884) : A : Fore end ; B : Tail, ventral view ; C : Animal *in toto* ; D : Tail : lateral view. De Man (1921) : E : Fore end. Kischke (1956) : F : Tail ; G : Fore end ; *Criconemoides kirjanovae* from De Grisse and Loof (1965). Male : H : Animal *in toto* ; I, J : Fore ends ; K : Esophageal area ; L : Lateral field ; M, N : Tails ; O : Terminus of tail.

Table 1
Morphometrical data of males of "*Macroposthonia annulata*" and *Criconemoides kirjanovae*

| | " <i>Macroposthonia annulata</i> " | | | <i>Criconemoides kirjanovae</i> | | |
|----------------|-------------------------------------|--------------------------------|------------------------------|------------------------------------|-----------|------------|
| | De Man (1880/1884) Netherland | De Man (1921) Netherland | Kischke (1956) Germany | De Grisse & Loof (1965) Belgium | Germany | Netherland |
| n | ? | 1 | 2 | 3 | 3 | 7 |
| L (mm) | 0.51 | 0.326 | 0.42-0.43 | 0.38-0.42 | 0.45-0.48 | 0.44-0.50 |
| a | 19-22 | 24 | 16.4-18.0 | 16-19 | 23 | 19-21 |
| b | 4-4.5 | — | 4.0-4.2 | — | — | 3.9-5.0 |
| c | 10-14 | 17 | 8.6-9.1 | 11-12 | 12-15 | 10-12 |
| tail (μm) | [36.5-51] * | 19.2 | [46-50] * | — | — | — |
| | [46] ** | | [54.5] ** | | | |
| spicules (μm) | [37] ** | 22 | 51-52.6 | 35-38 | 34-39 | 36-38 |
| | | | [59] ** | | | |
| "head" shape | conical | rounded | rounded | rounded | rounded | rounded |
| lat. incisures | 2 | ? | 2 | 4 | 4 | 4 |

* calculated from L : c.

** measured on original drawings.

although he distinguished this with a question mark in his listing of the genera of Tylenchida. T. Goodey (1951) agreed to the presence of a true bursa but regarded *Macroposthonia* as *incertae sedis*. Skarbilovich (1959) stated that the bursa is absent but recognized *Macroposthonia* as a valid genus. Tarjan (1960) did not agree with this opinion and stated that the presence of a true bursa excludes *Macroposthonia* from Paratylenchinae. Later Tarjan (1966) preferably regarded *M. annulata* as a *species indeterminata*. J. B. Goodey (1963) listed *Macroposthonia* as a valid genus of the Paratylenchinae, perhaps identical to *Paratylenchus*. It is difficult to understand such a controversy, the illustration (Fig. 2 B, D) given by De Man (1884) being perfectly clear on that point : the bursa appears well developed laterally and with cuticle encircling the tail.

De Grisse and Loof (1965) reported the collection of males resembling De Man's specimens from several locations (Belgium, Germany, Netherlands) and found females associated with males at Bergen-op-Zoom (Netherlands) which is about 70 km from the type locality. These females they identified as *Criconemoides kirjanovae* Andrassy, 1962, which was confirmed by Andrassy himself. The conclusion drawn was the synonymy of *C. kirjanovae* with *Macroposthonia annulata* and the re-establishment of

Macroposthonia De Man, 1880 as a valid genus. No mention of type was made at the occasion. Nevertheless the holotype, female, of *C. kirjanovae* should be considered as the type of *Macroposthonia annulata* (Art. 72 c of the International Code of Zoological Nomenclature).

The question as to the identity of *Macroposthonia* remains, however, since there is doubt as to the conspecificity of *C. kirjanovae* males and *M. annulata* males (when speaking of *Macroposthonia* males, we refer to the De Man's 1880/1884 data only). For one thing, the anterior end of the *M. annulata* male does indeed taper more abruptly than most criconematid males and the males illustrated by De Grisse and Loof (Fig. 2, I, J) show the more conventional rounded head. (Loof and De Grisse (1973) in their more recent diagnosis of *Macroposthonia* noted : « Males : head end rounded... »). More importantly, the lateral field as noted by De Man (1880) in the description (Fig. 1) is « relatively narrow » (8-16% of the body diameter); it consists of two longitudinal incisures (Fig. 2 C, D) whereas the males of *C. kirjanovae* have four equally spaced incisures (Fig. 2 L, M, N) occupying about 25-29% of the body diameter. Among Criconematidae, the structure of the lateral field is one of the main characters of the male taken into consideration in the definition of species, in some cases even for genera (De

Grisse & Loof, 1973), and thus cannot be ignored. The argument of Loof and De Grisse (1973) that De Man « always illustrated smaller species with two lateral lines » even if there were more, cannot be accepted. To decide on four is arbitrary and the original author must be followed. Moreover, the body annulation appears quite different in both species. Males of *C. kirjanovae* show a narrow and discrete annulation which is most frequent in the group, whereas *M. annulata* shows a pronounced and large annulation, a character which De Man (1880) underlined in the description of the species (Fig. 1) and which is observed in other species of the group, as in *C. amorphus* f. ex.

The only conclusion to be drawn is that *M. annulata* is not conspecific with *C. kirjanovae*. In the absence of type specimens, including females, on which to judge its status, *Macroposthonia annulata* De Man, 1880 should be considered a *genus et species dubia*. Earlier Tarjan (1966) considered *M. annulata* a *species indeterminata* but it is considered more properly designated as stated above. As a consequence *Criconemoides kirjanovae* Andrassy, 1962 should be restored to the status of a distinct and valid species.

De Grisse and Loof (1965) considered *M. annulata apud* Kischke, 1956 as being *Nothocriconema annuliferum* (De Man, 1921) De Grisse & Loof, 1965, type species of this genus. But the male they illustrated (no measurements were given) is quite different from Kischke's specimens, namely by its lateral field with three incisures (said to be characteristic of the genus *Nothocriconema*). Instead there are two incisures on Kischke's specimens which in addition have a more pointed tail (Fig. 2 F). Thus we cannot consider *M. annulata apud* Kischke, 1956 as being *Nothocriconema annuliferum* (De Man, 1921) De Grisse & Loof, 1965. We believe it best considered as *species indeterminata*.

Status of *Criconemoides morgensis*
(Hofmänner in Hofmänner & Menzel, 1914)
Taylor, 1936

Taylor (1936) revised the Criconematinae and proposed a new genus, *Criconemoides*, designating the oldest species, *C. morgensis* (Hof-

männer & Menzel, 1914), as the type species of this genus to which he transferred ten species previously described in three other genera, *Hoplolaimus*, *Iota*, and *Criconema*. He also described four new species.

The type species was generally accepted until De Grisse and Loof (1965) revised the genus *Criconemoides*. They judged the original description of *C. morgensis* to be incomplete since none of the characters used in their generic divisions could be inferred from it. They also were unable to locate or collect type specimens for a more detailed study and concluded *Criconemoides morgensis* must be declared *genus et species inquirenda*. As a consequence, a number of species belonging to *Criconemoides* were transferred to *Macroposthonia*.

Later, Loof and De Grisse (1967) reported the discovery of two « type specimens », one each on two separate slides in the possession of Dr. E. Altherr, Aigle, Switzerland. Both slides were labelled « Morges Riv. 2 III 1912 ». One specimen in extremely poor condition was judged to be a *Nothocriconema*, probably *N. princeps*, and was dismissed as *C. morgense*. The second specimen was mounted in glycerine and preserved in better condition. Unfortunately the specimen was lost during remounting but was measured and examined before its loss. Prior to this, these slides were examined by one of the authors (D.J.R.) who concluded in a letter to Altherr (dated Sept. 1966) : « none of these [specimens] fits with the published description of *C. morgensis*. The slide labeled *C. morgense* (in glycerine) has no resemblance ; the other in Canada balsam may have the conoid tail... but the head is completely different ». To the contrary, in the opinion of Loof and De Grisse (1967), the « specimen [in glycerin] agrees well with the description and illustration of Hofmänner and Menzel ». They concluded it represented « the true *C. morgensis* ». That specimen was considered by Loof and De Grisse (1967) to agree « in every respect with the description of *Criconemoides pseudohercyniensis* De Grisse & Koen, 1964, which species was found by us at the type locality of *C. morgensis*. » It must be noted that no type locality was designated as such in the publication of Hofmänner and Menzel (1914) which gave three different locations : « Léman, Mundung der Morges, im feuchten Schlamm. Vierwalds-

tättersee, am Litoral. Einmal, im Moospolster bei Vevey". [transl. : "Damp mud at the mouth of Morges River. Littoral zone, Lake of Lucerne. "One time" (?), moss bed at Vevey"]. Taylor (1936) reported too the three locations. Loof and De Grisse (1967) further considered *C. pseudohercyniensis* a junior synonym of *C. morgensis* ⁽¹⁾ and designated one of fifteen so-called topotypes to be neotype. As a consequence, a number of *Macroposthonia* species were transferred back to *Criconemoides*.

It is significant that neither of the above slides was labelled or designated as a type specimen. Also the label reproduced in a photograph by Loof and De Grisse bears "Gen. ? spec. ?" above the name *Criconema morg.* Hofm. This could very well be interpreted as an indication of doubt as to its identification in a quite similar way as in the first slide also labelled *Criconema morgense* but is obviously of *Nothocriconema* type. Most likely doubt existed as to the identification of both slides as *C. morgensis* and with good reason.

The proposed synonymy of *C. pseudohercyniensis* with *C. morgensis* cannot be admitted in view of two evidences :

— if in the original description of *C. morgensis* Holmänner and Menzel (1914) describe the anterior end as somewhat set off but devoid of setae or lip appendages ("Vorderende... etwas abgesetzt, aber ohne Borsten- oder Lippenbildungen"); in their subsequent publication (1915) they stated that the anterior end is not set off but bears a little lip-like appendage ("Kopfende... nicht abgesetzt, trägt... aber einen kleinen lippenartigen Aufsatz"). To interpret this apparent contradiction, we have to keep in mind that the illustration of *C. morgense* was given in the second paper (1915); the reexamination of the specimen (s) when used for the drawing could have led the authors to give a different, and more accurate, description of the fore end structure.

Another interpretation could be that the 1915's drawings have been made on a specimen different from this used for 1914's description.

⁽¹⁾ This synonymization was given first, without explanations, in an earlier publication (De Grisse, 1967).

Anyway this lip-like appendage appears clearly on this illustration (Fig. 3 A, B) and it can be tentatively interpreted as well-developed and forwards projected submedian lobes, as they exist for example in *Criconemoides surinamensis*. They can be too, but less surely, interpreted as a forward projected first annule, as common in various genera close to *Criconemoides*. Comparatively *C. pseudohercyniensis* shows very weakly differentiated submedian lobes, difficult to distinguish in lateral view, this leading to a rounded outline of the fore end (Fig. 3 C, D, I). Thus the structure described and illustrated in both these reports are very different and cannot be accurately considered as pertaining to the same species.

— the "tail" (actually the postvulval part) of *C. morgensis* is described by Hofmänner and Menzel (1914) as narrowing quickly to its end ("Der Schwanz spitzt sich rasch seinem Ende zu"), and in the 1915 paper, as giving the impression the annules are telescoped into one another ("Schwanzende erwecken sie die Eindrücke als wären sie teleskopartig in einander geschoben"); the illustration (Fig. 3 A, J) clearly shows a conical postvulval part with pointed terminus, such an outline being not rare among criconematids. On the contrary the postvulval part of *C. pseudohercyniensis* (Fig. 3 E, I) ended in a rounded shape. Thus these two different outlines of the postvulval part, a character very important in the definition of *Criconemoides* species, prevent consideration of *C. morgensis* and *C. pseudohercyniensis* as representing the same species.

Loof and De Grisse (1967) propose a supposition that the specimen which was drawn "actually had a truncate 'tail', but that the drawing corrected this". They advanced three arguments to support this supposition none of which is pertinent. In the first place telescoping annules of a truncate "tail" (presumably by fixation) would accentuate that characteristic and result in a "tail" even more blunt-truncate. To suggest that the authors were not accurate in their illustration appears difficult to admit, and could lead to remodeling of any illustration given by previous authors. It is interesting to note that in an article written at the same time as the paper cited above (Loof & De Grisse, 1967) but published shortly earlier, De Grisse

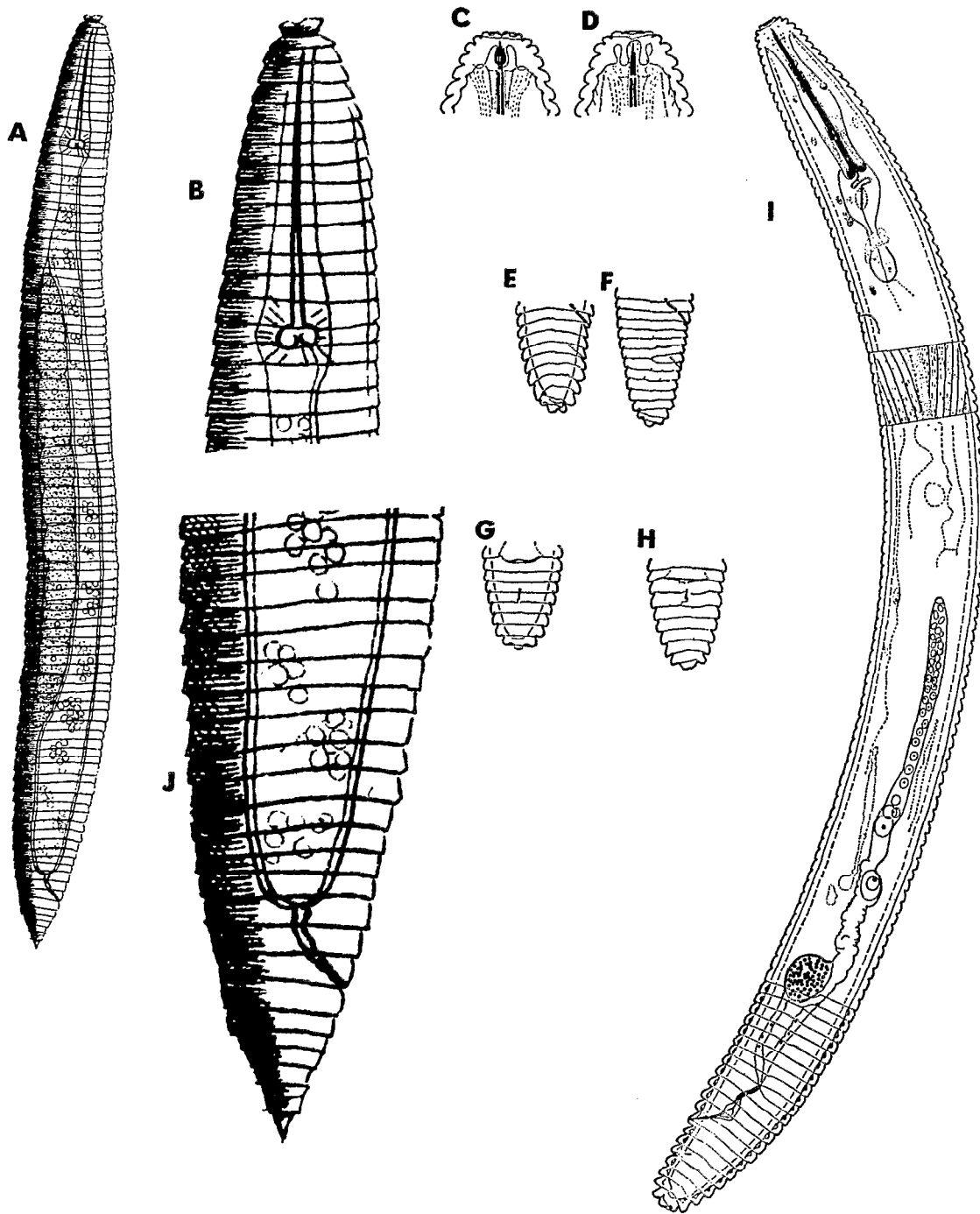


Fig. 3. *Criconemoides morgensis* original illustration by Hofmänner and Menzel (1915). Female. A : Animal *in toto* ; B : Anterior part ; J : Posterior part ; (B & J : approx. $\times 3$ partial enlargement of A). *Criconemoides pseudohercyniensis* original illustration by De Grisse and Koen (1964) Female. C : Fore end, lateral view ; D : Fore end, ventral view ; E, F : Postvulval part, lateral view ; G, H : Postvulval part, ventral view ; I : Animal *in toto*.

(1967) considered as junior synonyms of *C. morgensis* not only *C. pseudohercyniensis* but also *C. annulatus* Taylor, 1936 (= *Macroposthonia taylora* (Taylor, 1936) De Grisse & Loof, 1965) together with the junior synonyms of this species proposed by Raski and Golden (1966), i.e. *C. rotundicaudatus* Wu, 1965 and *C. hemisphaericaudatus* Wu, 1965. No mention of this synonymization was made in the subsequent publication (Loof & De Grisse, 1967) and one of these authors later disagreed with it (Loof, 1971; 1974). *C. annulatus* and *C. pseudohercyniensis* are commonly admitted as valid and distinct species; and they resemble more each other than each of them resembles to *C. morgensis*. This report weakens, once more, the arguments for a conspecificity of *C. morgensis* and *C. pseudohercyniensis*.

Since there are no type specimens known to exist, the description and illustrations must be accepted as presented by Hofmänner and Menzel. Most likely the specimen examined by Loof and De Grisse was indeed *C. pseudohercyniensis* but *C. morgensis* remains distinctly different despite failures to collect again in "type" localities.

The only conclusion to be drawn is to acknowledge the correctness of De Grisse and Loof (1965) when they declared *Criconemoides morgensis* (Hofmänner in Hofmänner & Menzel, 1914) Taylor, 1936 *genus et species inquirenda*. However, we think that it is more appropriate to designate these taxa as *genus et species dubia*. Consequently the neotype designated by Loof and De Grisse (1967) for *C. morgensis* must be considered as non valid (International Code of Zoological Nomenclature, Art. 75/c/4) and *C. pseudohercyniensis* should be restored to the status of a valid species. Is, however, *C. pseudohercyniensis* the valid name for this species? In a recent description of *C. morgensis*, Loof (1974) gave in the list of synonyms both *C. pseudohercyniensis* and *Criconemoides hercyniensis* (Kischke, 1956) Meyl, 1961 (= *C. morgensis* subsp. *hercyniensis* Kischke, 1956). If we admit this synonymy the valid name is *C. hercyniensis*. But the data given by Kischke (1956) in the original description of *C. hercyniensis* are lacking concerning the anterior part. Although a great resemblance exists in the shape of the post-vulval part in the two species, some discrep-

ancies exist concerning the position of the vulva, the anus and the length of the body. Thus we judge it more appropriate to consider, as generally accepted, *C. hercyniensis* as *species inquirenda* and *C. pseudohercyniensis* as a valid species.

Identity of *Macroposthonia* sensu De Grisse & Loof to *Criconemoides* sensu De Grisse & Loof

Quite apart from the preceding actions is a question as to the validity of the genus *Macroposthonia* as proposed by De Grisse and Loof (1965). This was modified by Loof and De Grisse (1967) and further defined by them (1973).

The distinction between *Macroposthonia* and *Criconemoides* (sensu Loof & De Grisse) appears quite variable when one considers the evolution of this question in the various publications of De Grisse and Loof: when *Criconemoides* was declared *genus inquirendum* (1965), no apparent difficulty existed for the grouping in *Macroposthonia* of a certain number of species previously pertaining to *Criconemoides*. When *Criconemoides* was reestablished (Loof & De Grisse (1967), some species were transferred back to this genus; at that time two characters were used for differentiation: 1) the fact that the submedian lobes are connected laterally in *Criconemoides* but not in *Macroposthonia*. This character is difficult to observe and, mainly, many exceptions exist in both genera (Luc, 1970). 2) The structure of the vulva was said to be "open" in *Macroposthonia* and "closed" in *Criconemoides*; this character appears better than the preceding one, although exceptions exist here too: *M. peruensis* has a "closed" vulva and in the *Macroposthonia* species with a "sigmoid" vagina (*M. basili*, *M. longistyleta*, *M. oostenbrinki*, *M. xenoplax* f. ex.) the appearance of vulva is resembling more the "closed" type than the "open" one. Nevertheless we consider that such a unique character is not sufficient to differentiate two genera.

In conclusion all species currently in *Macroposthonia* sensu De Grisse & Loof and *Criconemoides* sensu De Grisse & Loof should be assigned again to a single genus.

The genus *Criconemella* De Grisse & Loof, 1965

When created by De Grisse and Loof (1965), the genus *Criconemella* included four species, *C. parva* (type species), *C. parvula*, *C. goodeyi* and *C. zavadskii*. The females were mainly characterized (De Grisse & Loof, 1965; Loof & De Grisse, 1973) by a small body size (0.20-0.37 mm) accompanied by a relatively great number of finely crenate body annules (100-200); the absence of submedian lobes and of a differentiated head annule; the vulva is of "closed" type; males present a conoid anterior end, three lines in the lateral field, and a distinct bursa.

Considering in detail these four species, it appears that all these characters are not absolutely constant: submedian lobes do exist in *C. parva*; the crenation of the body annules was not noted by the authors of both *C. parva* (Raski, 1952) and *C. parvula* (Siddiqi, 1961) although further populations of both these species show it (De Grisse & Loof, 1965; Luc, 1970); in its 1969's key, De Grisse mentioned *C. parvula* and *C. zavadskii* as having smooth annules. Heyns (1970) observed that in *C. parva* from South Africa the crenation may vary following the population. Thus this character appears as inconstant and/or at the limit of the microscope power. The male have four lines in the lateral field, as in *C. goodeyi* (Luc, 1970), whereas a three-lined lateral field was noted by Loof and De Grisse (1973) in the amended diagnosis of *Criconemella*; thus the number of lateral lines in male appears as variable and/or too difficult to observe to constitute a good generic character.

Thus these *Criconemella* species, and the genus itself, appeared mainly characterized by the combination of relatively small body size and relatively great number of annules, although each of these characters can be observed in some species originally included in *Macroposthonia/Criconemoides*; for example the body length is only 0.27-0.33 mm in *C. crenatus* and 0.25-0.35 mm in *C. yapoensis*; the number of body annules can reach 132 in *C. palustris*, 137 in *C. annulatus* and even 160 in *C. vadensis*.

More recently Choi and Geraert (1975) described two species of *Criconemella* from

Korea: *C. myungsugae* and *C. paragoodeyi*. Both these species differ notably from the above mentioned species by their larger body size and fewer number of body annules: 0.445-0.500 mm and 122-127, respectively, for *C. myungsugae*; 0.375-0.460 mm and 132-137 for *C. paragoodeyi*. This large body size led the authors to amend the diagnosis of *Criconemella* on that particular point. Note that males are not known for these species.

In fact, these two species are very close to some of those pertaining to *Macroposthonia/Criconemoides* group. They were apparently placed in *Criconemella* because of the absence of submedian lobes and the fine crenation of the posterior edge of the body annules. But both these characters exist in species formerly placed in *Macroposthonia/Criconemoides*, and in some cases in combination (*C. caelata* for ex.).

Thus we consider that *C. myungsugae* and *C. paragoodeyi* are good links from *Criconemella* to *Macroposthonia/Criconemoides sensu* De Grisse & Loof, and that the six species of *Criconemella* are to be joined to those pertaining to the group "*Macroposthonia/Criconemoides*" above mentioned, and to be classified in the same genus.

The genus *Xenocriconemella* De Grisse & Loof, 1965

The genus *Xenocriconemella* De Grisse & Loof, 1965 is only represented by its type species: *X. macrodora*. The most recent diagnosis of the genus (Loof & De Grisse, 1973) is the following:

"Body: small (0.20-0.33 mm), plump. Annules: 99-120, smooth to slightly crenate, outline angular. Pseudolips: six, distinct, no submedian lobes. Head annules: not differentiated. Vulva: simple, closed. Spear, very long and flexible. Juveniles: annules crenate, no rows of scales; male L-4 without spear. Males: head end flatly rounded; three lateral lines; bursa very narrow."

The only distinctive character from species formerly attributed to the genera *Macroposthonia*, *Criconemoides* and *Criconemella* is the very long and flexible stylet. All other data taken in account in the diagnosis of *Xenocriconemella* may be found, associated or not, in a great number of other species. Note that actually the submedian lobes do exist in *X. macrodora*,

as proved by SEM end on view (slide n° 28 of the series offered for sale by De Grisse).

The stylet of *X. macrodora* is very long (75-110 μm or 29-47% of the body length), and flexible. Such a stylet can be observed in *M. longistyleta* (flexible stylet, 106-129 μm long), in *M. bakeri* (102-112 μm), and *M. incrasata* (90-106 μm); but in both these last cited species the stylet is apparently not flexible. It remains nevertheless that the great length of the stylet comparatively to the body length makes *X. macrodora* very peculiar in the group. But is this character, alone, sufficient to justify the placement of this species in a separate genus? We do not think so. If characters of the stylet, and namely its length, can be used alone for characterizing a separate genus, it would be more justified to use them to place *M. microdora* in a particular genus: in this species not only the stylet is considerably shorter (21-26 μm) than in all the other species, but the basal knobs are rounded, and devoid of the forward projection, characteristic of the Criconematidae.

Redefinition of *Criconemella*

Thus we estimate that all the species previously contained in the genera *Macroposthonia*, *Criconemoides*, *Criconemella* and *Xenocriconemella* have to be attributed to a single genus.

As the names of *Macroposthonia* and *Criconemoides* are no longer available, as demonstrated above, the valid name for this genus is *Criconemella* Loof & De Grisse, 1965; the genus *Xenocriconemella* Loof & De Grisse, 1965, has been defined in the same publication, but its description follows that of *Criconemella* which must have priority.

Genus *Criconemella* De Grisse & Loof, 1965
Choi & Geraert, 1975

- = *Macroposthonia apud* Loof & De Grisse, 1967; 1973.
- = *Criconemoides apud* Loof & De Grisse, 1967; 1973; Raski & Golden, 1966 *p. parte*; Tarjan, 1966, *p. parte*; Luc, 1970, *p. parte*.
- = *Xenocriconemella* De Grisse & Loof, 1965.
- = *Mesocriconema* Andr ssy, 1965, *p. parte*.

= *Neocriconema* Diab & Jenkins, 1965.

= *Madinema* Khan, Chawla & Saha, 1976, *p. parte*.

DIAGNOSIS, EMENDED

“Criconematidae. Females: Body of variable length (0.20-1.00 mm). Annules 42-200; posterior edge smooth to finely crenate. Submedian lobes generally well-developed, but may be poorly developed and even absent in some species; separated or connected in different ways; first annule may be reduced or even divided into plates; in some species (*C. amorphia*, *C. aexetis*, *C. citricola*) first annule not retorse but more or less forward directed. Vulval lips closely appressed (vulva “closed”) to rather widely separated (vulva “open”); anterior lip may be ornamented. Spear strong, rarely thin and flexible (*C. macrodora*, *C. longistyleta*), exceptionally short with rounded basal knobs (*C. microdora*). Juveniles: Annules smooth to crenate, no rows of scale (except *C. incrasata*). Males: Head end rounded to conoid; generally four lateral lines, rarely three, exceptionally two (*C. oostenbrinski*); bursa distinct, exceptionally absent (*C. goodeyi*).”

COMMENTS ON SYNONYMIES

Discussion on the validity of two genera, *Mesocriconema* Andr ssy, 1965 and *Neocriconema* Diab & Jenkins, 1965, have been published by Luc (1970) for both genera and by Tarjan (1966) for the latter. Both Luc and Tarjan concluded that these genera, both based on the same unique character (fine crenation of the posterior edge of female annules), are not valid, more important differences existing between the species they reassembled. The genus *Madinema* Khan, Chawla & Saha, 1976 was created for “specimens having a combination of characters of *Macroposthonia* and *Discocriconemella*”. Andr ssy (1979) judged the “characteristics of the type species, *Madinema maglia* Khan, Chawla & Saha correspond well to the criteria of the genus *Macroposthonia*” and synonymized *Madinema* with *Macroposthonia*. Khan, Chawla and Saha (1976) transferred to this new genus two

species of *Macroposthonia/Criconemoides* and five of *Discocriconemella*; they also described two new species, one of which being the type of the genus. The two first cited species transferred (*Macroposthonia longistyleta* De Grisse & Maas, 1970 and *Criconemoides incrassatus* Raski & Golden, 1965) and both new species (*Madinema maglia* and *M. loma*) show no evident characters permitting their separation from other species of *Criconemella*. The remaining species are quite close to *Discocriconemella*. Thus the genus *Madinema* appears artificial; to maintain it is not a good way to solve the difficulties of the relationship between the genera of Criconematidae. Therefore rejection of that generic proposal appears justified.

Luc (1970) considered *Macroposthonia* and *Criconemoides* as well as the genera created by De Grisse and Loof (1965) i. e. *Nothocriconema Lobocriconema*, *Discocriconemella*, *Criconemella*, *Xenocriconemella*, as synonymous, and retained for them the name of *Criconemoides*. That treatment perhaps was too drastic and requires further thought. This is especially needed in light of data provided since then, mainly the numerous SEM en-face photographs that have been published. A further publication will be devoted to the validity of definition and inter-relationships of the genera of De Grisse and Loof not treated here, as well as of some related genera described since.

LIST OF THE SPECIES OF THE GENUS CRICONEMELLA DE GRISSE & LOOF 1965

TYPE SPECIES :

- C. parva* (Raski, 1952) De Grisse & Loof, 1965
 - = *Criconemoides parvus* Raski, 1952
 - = *Neocriconema adamsi* Diab & Jenkins, 1965
 - = *Criconemoides microserratus* Raski & Golden, 1966

OTHER SPECIES :

- C. amorpha* (De Grisse, 1967) nov. comb.
 - = *Criconemoides amorphus* De Grisse, 1967
 - = *Criconemoides tafaensis* Luc, 1970
- C. annulata* (Cobb in Taylor, 1936) nov. comb.
 - = *Criconemoides annulatus* Cobb in Taylor, 1936
 - = *Macroposthonia taylori* De Grisse & Loof, 1965
 - = *Criconemoides hemisphaericaudatus* Wu, 1965
 - = *Criconemoides rotundicaudatus* Wu, 1965

- = *Macroposthonia hemisphaericaudata* (Wu, 1965) De Grisse & Loof, 1965
- = *Macroposthonia rotundicaudata* (Wu, 1965) De Grisse & Loof, 1965
- C. annulatiformis* (De Grisse & Loof, 1967) nov. comb.
 - = *Macroposthonia annulatiformis* De Grisse & Loof, 1967
 - = *Criconemoides annulatiformis* (De Grisse & Loof, 1967) Luc, 1970
- C. antipolitana* (de Guiran, 1963) nov. comb.
 - = *Criconemoides antipolitanus* de Guiran, 1963
 - = *Criconemoides macrolobatus* Jairajpuri & Siddiqi, 1963
 - = *Macroposthonia antipolitana* (de Guiran, 1963) De Grisse & Loof, 1965
 - = *Macroposthonia macrolobata* (Jairajpuri & Siddiqi, 1963) De Grisse & Loof, 1965
- C. axestis* (Fassuliotis & Williamson, 1959) nov. comb.
 - = *Criconemoides axestis* Fassuliotis & Williamson, 1959
 - = *Macroposthonia axestis* (Fassuliotis & Williamson, 1959) De Grisse & Loof, 1965
- C. azania* (Van Den Berg, 1979) nov. comb.
 - = *Macroposthonia azania* Van Den Berg, 1979
 - = *Discocriconemella glabrannulata apud* Heyns, 1970 *nec* De Grisse, 1967
- C. bakeri* (Wu, 1965) nov. comb.
 - = *Criconemoides bakeri* Wu, 1965
 - = *Macroposthonia bakeri* (Wu, 1965) De Grisse & Loof, 1965
 - = *Criconemoides kamaltei* Khan, 1971
- C. basili* (Jairajpuri, 1964) nov. comb.
 - = *Criconemoides goodeyi* Jairajpuri, 1963 *nec* de Guiran, 1963
 - = *Criconemoides basili* Jairajpuri, 1964
 - = *Macroposthonia basili* (Jairajpuri, 1964) De Grisse & Loof, 1965
 - = *Macroposthonia michieli* Edward, Misra & Singh, 1968
- C. brevistyla* (Singh & Khera, 1976) nov. comb.
 - = *Criconemoides brevistylus* Singh & Khera, 1976
 - = *Macroposthonia brevistyla* (Singh & Khera, 1976) Ebsary, 1979
- C. britsiensis* (Heyns, 1970) nov. comb.
 - = *Macroposthonia britsiensis* Heyns, 1970
- C. caballeroi* (Cid del Prado, 1978) nov. comb.
 - = *Macroposthonia caballeroi* Cid del Prado, 1978
- C. caelata* (Raski & Golden, 1966) nov. comb.
 - = *Criconemoides caelatus* Raski & Golden, 1966
 - = *Macroposthonia caelata* (Raski & Golden, 1966) De Grisse, 1967
- C. citricola* (Siddiqi, 1965) nov. comb.
 - = *Criconemoides citricola* Siddiqi, 1965
 - = *Macroposthonia citricola* (Siddiqi, 1965) De Grisse, 1967

- C. crenata* (Loof, 1964) nov. comb.
 = *Criconemoides crenatus* Loof, 1964
 = *Macroposthonia crenata* (Loof, 1964) De Grisse & Loof, 1965
 = *Neocriconema crenatum* (Loof, 1964) Diab & Jenkins, 1965
 = *Mesocriconema crenatum* (Loof, 1964) Andrassy, 1965
- C. cufeum* (Khan, Chawla & Saha, 1976) nov. comb.
 = *Macroposthonia cufeum* Khan, Chawla & Saha, 1976
- C. curvata* (Raski, 1952) nov. comb.
 = *Criconemoides curvatus* Raski, 1952
 = *Criconemoides tescorum* de Guiran, 1963
 = *Criconemoides nainitalensis* Edward & Misra, 1963
 = *Macroposthonia curvata* (Raski, 1952) De Grisse & Loof, 1965
 = *Macroposthonia tescorum* (de Guiran, 1963) De Grisse & Loof, 1965
 = *Macroposthonia nainitalensis* (Edward & Misra, 1963) De Grisse & Loof, 1965
 = *Macroposthonia coomansi* De Grisse, 1967
 = *Criconemoides dorsoflexus* Boonduang & Ratanaprapa, 1974
- C. denoudenii* (De Grisse, 1967) nov. comb.
 = *Macroposthonia denoudenii* De Grisse, 1967
 = *Criconemoides denoudenii* (De Grisse, 1967) Luc, 1970
- C. dherdei* (De Grisse, 1967) nov. comb.
 = *Macroposthonia dherdei* De Grisse, 1967
 = *Criconemoides dherdei* (De Grisse, 1967) Luc, 1970
- C. discus* (Thorne & Malek, 1968) nov. comb.
 = *Criconemoides discus* Thorne & Malek, 1968
 = *Macroposthonia discus* (Thorne & Malek, 1968) Loof & De Grisse, 1973
- C. divida* (Raski & Riffle, 1967) nov. comb.
 = *Criconemoides divida* Raski & Riffle, 1967
 = *Macroposthonia divida* (Raski & Riffle, 1967) De Grisse, 1967
- C. ferniae* (Luc, 1959) nov. comb.
 = *Criconemoides ferniae* Luc, 1959
 = *Criconemoides obtusicaudatus* Heyns, 1962
 = *Macroposthonia ferniae* (Luc, 1959) De Grisse & Loof, 1965
 = *Macroposthonia obtusicaudata* (Heyns, 1962) Heyns, 1970
- C. goodeyi* (de Guiran, 1963) De Grisse & Loof, 1965
 = *Criconemoides goodeyi* de Guiran, 1963
 = *Neocriconema goodeyi* (de Guiran, 1963) Diab & Jenkins, 1965
 = *Mesocriconema goodeyi* (de Guiran, 1963) Andrassy, 1965
- C. hlaqa* (Van Den Berg, 1979) nov. comb.
 = *Macroposthonia hlaqa* Van Den Berg, 1979
- C. humilis* (Raski & Riffle, 1967) nov. comb.
 = *Criconemoides humilis* Raski & Riffle, 1967
- C. incisa* (Raski & Golden, 1966) nov. comb.
 = *Criconemoides incisus* Raski & Golden, 1966
 = *Macroposthonia incisa* (Raski & Golden, 1966) De Grisse, 1967
- C. incrassata* (Raski & Golden, 1966) nov. comb.
 = *Criconemoides incrassatus* Raski & Golden, 1966
 = *Macroposthonia incrassata* (Raski & Golden, 1966) De Grisse, 1967
 = *Madinema incrassatum* (Raski & Golden, 1966) Khan, Chawla & Saha, 1976
- C. informis* (Micoletzky, 1922) nov. comb.
 = *Hoplolaimus informis* Micoletzky, 1922
 = *Criconema informe* (Micoletzky, 1922) Micoletzky, 1925
 = *Criconemoides informis* (Micoletzky, 1922) Taylor, 1936
 = *Criconema anura* Kirjanova, 1948
 = *Criconemoides anura* (Kirjanova, 1948) Raski, 1958
 = *Criconemoides complexus* Jairajpuri, 1963
 = *Criconemoides flandriensis* De Grisse, 1964
 = *Macroposthonia informis* (Micoletzky, 1922) De Grisse & Loof, 1965
 = *Macroposthonia complexa* (Jairajpuri, 1963) De Grisse & Loof, 1965
 = *Criconemoides fimbriatus* Thorne & Malek, 1968
 = *Macroposthonia anura* (Kirjanova, 1948) Ivanova, 1976
- C. insignis* (Siddiqi, 1961) nov. comb.
 = *Criconemoides insignis* Siddiqi, 1961
- C. inusitata* (Hoffmann, 1974) nov. comb.
 = *Criconemoides inusitatus* Hoffmann, 1974
- C. irregularis* (De Grisse, 1964) nov. comb.
 = *Criconemoides irregularis* De Grisse, 1964
 = *Macroposthonia irregularis* (De Grisse, 1964) De Grisse & Loof, 1965
- C. kirjanovae* (Andrassy, 1962) nov. comb.
 = *Criconemoides kirjanovae* Andrassy, 1962
 = *Neocriconema kirjanovae* (Andrassy, 1962) Diab & Jenkins, 1965
- C. kralli* (Ivanova, 1976) nov. comb.
 = *Macroposthonia kralli* Ivanova, 1976
- C. lamottei* (Luc, 1970) nov. comb.
 = *Criconemoides lamottei* Luc, 1970
 = *Macroposthonia lamottei* (Luc, 1970) Loof & De Grisse, 1973
- C. loma* (Khan, Chawla & Saha, 1976) nov. comb.
 = *Madinema loma* Khan, Chawla & Saha, 1976
- C. longistyleta* (De Grisse & Maas, 1970) nov. comb.
 = *Macroposthonia longistyleta* De Grisse & Maas, 1970
 = *Madinema longistyletum* (De Grisse & Maas, 1970) Khan, Chawla & Saha, 1976
- C. macrodora* (Taylor, 1936) nov. comb.
 = *Criconemoides macrodorus* Taylor, 1936

- = *Xenocriconemella macrodora* (Taylor, 1936) De Grisse & Loof, 1965
 = *Criconema goffarti* Volz, 1951
 = *Criconemoides goffarti* (Volz, 1951) Goodey, 1963
 = *Criconemoides juniperi* Edward & Misra, 1964
- C. maglia* (Khan, Chawla & Saha, 1976) nov. comb.
 = *Madinema maglia* Khan, Chawla & Saha, 1976
- C. malusi* (Razzhivin, 1974) nov. comb.
 = *Macroposthonia malusi* Razzhivin, 1974
- C. maritima* (De Grisse, 1964) nov. comb.
 = *Criconemoides maritimus* De Grisse, 1964
 = *Macroposthonia maritima* (De Grisse, 1964) De Grisse & Loof, 1965
- C. maskaka* (Heyns, 1970) nov. comb.
 = *Macroposthonia maskaka* Heyns, 1970
- C. microdora* (De Grisse, 1964) nov. comb.
 = *Criconema microdorum* De Grisse, 1964
 = *Criconemoides microdorus* (De Grisse, 1964) De Grisse, 1964
 = *Macroposthonia microdora* (De Grisse, 1964) De Grisse & Loof, 1965
 = *Neocriconema microdorum* (De Grisse, 1964) Diab & Jenkins, 1965
 = *Mesocriconema microdorum* (De Grisse, 1964) Andrassy, 1965
- C. mongolensis* (Andrassy, 1964) nov. comb.
 = *Criconemoides mongolensis* Andrassy, 1964
- C. mongomorgum* (Darekar & Khan, 1979) nov. comb.
 = *Criconemoides mongomorgum* Darekar & Khan, 1979
- C. myungusugae* Choi & Geraert, 1975
- C. oblonglineata* (Razzhivin, 1974) nov. comb.
 = *Criconemoides oblonglineatus* Razzhivin, 1974
- C. onoensis* (Luc, 1959) nov. comb.
 = *Criconemoides onoensis* Luc, 1959
 = *Macroposthonia onoensis* (Luc, 1959) De Grisse & Loof, 1965
- C. oostenbrinki* (Loof, 1964) nov. comb.
 = *Criconemoides oostenbrinki* Loof, 1964
 = *Macroposthonia oostenbrinki* (Loof, 1964) De Grisse & Loof, 1965
 = *Neocriconema oostenbrinki* (Loof, 1964) Diab & Jenkins, 1965
 = *Mesocriconema oostenbrinki* (Loof, 1964) Andrassy, 1965
- C. ornata* (Raski, 1958) nov. comb.
 = *Criconemoides cylindricus* Raski, 1952 *nec* Kirjanova, 1948
 = *Criconemoides ornatus* Raski, 1958
 = *Macroposthonia ornata* (Raski, 1958) De Grisse & Loof, 1965
- C. palustris* (Luc, 1970) nov. comb.
 = *Criconemoides onoensis* f. *Kindia* Luc, 1959
 = *Criconemoides palustris* Luc, 1970
 = *Macroposthonia palustris* (Luc, 1970) Loof & De Grisse, 1973
- C. paragoodeyi* Choi & Geraert, 1975
- C. paramonovi* (Razzhivin, 1974) nov. comb.
 = *Macroposthonia paramonovi* Razzhivin, 1974
- C. parvula* (Siddiqi, 1961) De Grisse & Loof, 1965
 = *Criconemoides parvulus* Siddiqi, 1961
- C. peruensiformis* (De Grisse, 1967) nov. comb.
 = *Macroposthonia peruensiformis* De Grisse, 1967
 = *Criconemoides peruensiformis* (De Grisse, 1967) Luc, 1970
- C. peruensis* (Steiner, 1920) nov. comb.
 = *Hoplolaimus rusticus* var. *peruensis* Steiner, 1920
 = *Iota peruense* (Steiner, 1920) Cobb, 1924
 = *Criconema rusticum* var. *peruense* (Steiner, 1920) Micoletzky, 1925
 = *Criconemoides peruensis* (Steiner, 1920) Taylor, 1936
 = *Criconema peruense* (Cobb, 1924) De Coninck, 1939
 = *Macroposthonia peruensis* (Steiner, 1920) De Grisse & Loof, 1965
- C. pleriannulata* (Ebsary, 1979) nov. comb.
 = *Criconemoides pleriannulatus* Ebsary, 1979
- C. pruni* (Siddiqi, 1961) nov. comb.
 = *Criconema pruni* Siddiqi, 1961
 = *Criconemoides pruni* (Siddiqi, 1961) Raski & Golden, 1966
 = *Macroposthonia pruni* (Siddiqi, 1961) De Grisse & Loof, 1965
 = *Mesocriconema pruni* (Siddiqi, 1961) Andrassy, 1965
- C. pseudohercyniensis* (De Grisse & Koen, 1964) nov. comb.
 = *Criconemoides pseudohercyniensis* De Grisse & Koen, 1964
 = *Macroposthonia pseudohercyniensis* (De Grisse & Koen, 1964) De Grisse & Loof, 1965
 = *Neocriconema pseudohercyniense* (De Grisse & Koen, 1964) Diab & Jenkins, 1965
 = *Mesocriconema pseudohercyniense* (De Grisse & Koen, 1964) Diab & Jenkins, 1965
 = *Criconemoides morgensis* *apud* Loof & De Grisse, 1967 *nec* Hofmänner, 1914
- C. pseudosolivaga* (De Grisse, 1964) nov. comb.
 = *Criconemoides pseudosolivagus* De Grisse, 1964
 = *Macroposthonia pseudosolivaga* (De Grisse, 1964) De Grisse & Loof, 1965
 = *Neocriconema pseudosolivagum* (De Grisse, 1964) Diab & Jenkins, 1965
 = *Mesocriconema pseudosolivagum* (De Grisse, 1964) Andrassy, 1965
- C. raskiensis* (De Grisse, 1964) nov. comb.
 = *Criconemoides raskiensis* De Grisse, 1964
 = *Macroposthonia raskiensis* (De Grisse, 1964) De Grisse & Loof, 1965
 = *Neocriconema raskiense* (De Grisse, 1964) Diab & Jenkins, 1965
 = *Mesocriconema raskiense* (De Grisse, 1964) Andrassy, 1965

- C. reedi* (Diab & Jenkins, 1966) nov. comb.
 = *Criconemoides reedi* Diab & Jenkins, 1966
 = *Macroposthonia reedi* (Diab & Jenkins, 1966)
 De Grisse, 1967
- C. rihandi* (Edward, Misra & Singh, 1968) nov. comb.
 = *Criconemoides rihandi* Edward, Misra & Singh,
 1968
 = *Macroposthonia rihandi* (Edward, Misra &
 Singh, 1968) Loof & De Grisse, 1973
- C. rotundicauda* (Loof, 1964) nov. comb.
 = *Criconemoides rotundicauda* Loof, 1964
 = *Macroposthonia rotundicauda* (Loof, 1964) De
 Grisse & Loof, 1965
 = *Criconemoides parakouensis* Germani & Luc,
 1976
- C. rusium* (Khan, Chawla & Saha, 1976) nov. comb.
 = *Macroposthonia rusium* Khan, Chawla & Saha,
 1976
 = *Criconema quadricorne* Kirjanova, 1948, nov.
 syn.
 = *Criconemoides lobatus* Raski, 1952
 = *Macroposthonia rustica* (Micoletzky, 1915) De
 Grisse & Loof, 1965
 = *Criconemoides quadricornis* (Kirjanova, 1948)
 Raski, 1968, nov. syn.
 = *Macroposthonia quadricornis* (Kirjanova, 1948)
 Ivanova, 1976, nov. syn.
- C. similicrenata* (Cid del Prado, 1978) nov. comb.
 = *Macroposthonia similicrenata* Cid del Prado,
 1978
- C. solivaga* (Andrássy, 1962) nov. comb.
 = *Criconemoides solivagus* (Andrássy, 1962) De
 Grisse & Loof, 1965
 = *Criconemoides rosae* Loof, 1964
 = *Macroposthonia solivaga* (Andrássy, 1962) De
 Grisse & Loof, 1965
 = *Macroposthonia rosae* (Loof, 1964) De Grisse
 & Loof, 1965
 = *Neocriconema solivagum* (Andrássy, 1962) Diab
 & Jenkins, 1965
- C. sosamossi* (Cid del Prado, 1978) nov. comb.
 = *Macroposthonia sosamossi* Cid del Prado, 1978
- C. sphaerocephala* (Taylor, 1936) nov. comb.
 = *Criconemoides sphaerocephalus* Taylor, 1936
 = *Criconemoides citri* Steiner, 1949
 = *Macroposthonia sphaerocephala* (Taylor, 1936)
 De Grisse & Loof, 1965
 = *Criconemoides georgii* Prasad, Khan & Mathur,
 1966
- C. surinamensis* (De Grisse & Maas, 1970) nov. comb.
 = *Discocriconemella surinamensis* De Grisse &
 Maas, 1970
 = *Macroposthonia surinamensis* (De Grisse &
 Maas, 1970) Loof & De Grisse, 1973
- C. teres* (Raski, 1952) nov. comb.
 = *Criconemoides teres* Raski, 1952
 = *Macroposthonia teres* (Raski, 1952) De Grisse &
 Loof, 1965
- C. tulaganovi* (Kirjanova, 1948) nov. comb.
 = *Criconema tulaganovi* Kirjanova, 1948
 = *Criconemoides tulaganovi* (Kirjanova, 1948)
 Raski, 1958
 = *Macroposthonia tulaganovi* (Kirjanova, 1948)
 De Grisse & Loof, 1965
- C. vadensis* (Loof, 1964) nov. comb.
 = *Criconemoides vadensis* Loof, 1964
 = *Macroposthonia vadensis* (Loof, 1964) De Grisse
 & Loof, 1965
- C. vernus* (Raski & Golden, 1966) nov. comb.
 = *Criconemoides vernus* Raski & Golden, 1966
- C. wolgogica* (Choi & Geraert, 1975) nov. comb.
 = *Macroposthonia wolgogica* Choi & Geraert, 1975
- C. xenoplax* (Raski, 1952) nov. comb.
 = *Criconemoides xenoplax* Raski, 1952
 = *Macroposthonia xenoplax* (Raski, 1952) De
 Grisse & Loof, 1965
- C. yapoensis* (Luc, 1970) nov. comb.
 = *Criconemoides yapoensis* Luc, 1970
 = *Macroposthonia yapoensis* (Luc, 1970) Loof &
 De Grisse, 1973
- C. yossifovichi* (Krnjaic, 1967) nov. comb.
 = *Discocriconemella yossifovichi* Krnjaic, 1967
 = *Macroposthonia yossifovichi* (Krnjaic, 1967)
 Loof & De Grisse, 1973
- C. zavadskii* (Tulaganov, 1941) De Grisse & Loof,
 1965
 = *Hoplolaimus zavadskii* Tulaganov, 1941
 = *Criconemoides zavadskii* (Tulaganov, 1941)
 Raski, 1958

SPECIES INQUIRENDAE VEL DUBIAE ATTRIBUTED
 TO THE GENUS CRICONEMOIDES

- C. beljaevae* (Kirjanova, 1948) Raski, 1958
 = *Criconema rusticum apud* Beljaeva, 1937 (*nec*
 Micoletzky, 1915)
 = *Criconema beljaevae* Kirjanova, 1948
 = *Macroposthonia beljaevae* (Kirjanova, 1948)
 Ivanova, 1976
- C. congolensis* (Schuurmans Stekhoven & Teunis-
 sen, 1938) Goodey, 1951
 = *Criconema congolense* Schuurmans Stekhoven
 & Teunissen, 1938
- C. cylindricus* (Kirjanova, 1948) Raski, 1958
 = *Criconema cylindricum* Kirjanova, 1948
- C. heideri* (Stefanski, 1916) Taylor, 1936
 = *Criconema heideri* Stefanski, 1916
 = *Hoplolaimus heideri* (Stefanski, 1916) Menzel,
 1917
- C. hercyniensis* (Kischke, 1956) Meyl, 1961
 = *Criconemoides morgensis hercyniensis* Kischke,
 1956
- C. hispalensis* Delgado, Pedregal & Millan, 1963

- C. hygrophilus* Goodey, 1963
 = *Criconema stygia* Schneider, 1940
 = *Criconema annulifer* f. *hygrophilum* Andrassy, 1952
 = *Nothocriconema hygrophilum* De Grisse & Loof, 1965
- C. komabaensis* (Imamura, 1931) Taylor, 1936
 = *Criconema komabaense* Imamura, 1931
- C. montserratii* Delgado, Millan & Pedregal, 1965
- C. morgensis* (Hofmänner in Hofmänner & Menzel, 1914) Taylor, 1936
 = *Criconema morgense* Hofmänner in Hofmänner & Menzel, 1914
 = *Hoplolaimus morgensis* (Hofmänner in Hofmänner & Menzel, 1914) Menzel, 1917
- C. pullus* (Kirjanova, 1948) Raski, 1958
 = *Criconema pullum* Kirjanova, 1948
- C. sagaensis* Yokoo, 1964
- C. similis* (Cobb, 1918) Chitwood, 1949
 = *Iota simile* Cobb, 1918
 = *Hoplolaimus similis* (Cobb, 1918) Micoletzky, 1922
 = *Macroposthonia similis* (Cobb, 1918) De Grisse & Loof, 1965
- C. sinensis* (Rahm, 1937) Goodey, 1951
 = *Hoplolaimus sinensis* Rahm, 1937
- C. tenuiannulatus* (Tulaganov, 1949) Raski & Golden, 1965
 = *Criconema tenuiannulatum* Tulaganov, 1949
 = *Macroposthonia tenuiannulata* (Tulaganov, 1949) Ivanova, 1976
- C. tenuicutis* (Kirjanova, 1948) Raski, 1958
 = *Criconema tenuicute* Kirjanova, 1948

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