

## ARBOVIRUSES IN THE BRAZILIAN AMAZON REGION

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Studies in the Amazon region of Brazil carried out between November 1954 and June 1991 revealed the presence of 181 different types of arboviruses, belonging to several antigenic and taxonomic groups, some of which include certain viruses not transmitted by arthropods. Of these arboviruses, 157 were isolated for the first time in Brazil and 87 of them have been confirmed to be new to the world. Thirty-three of these viruses are known to cause illness in man. Clinical manifestations range from mild febrile, which may or may not be accompanied by skin rash and by arthralgia to severe and often fatal haemorrhagic fever. Four arboviral disease considered at present as the most important in public health are discussed: Oropouche (ORO), Mayaro (MAY), Yellow fever (YF) and Dengue (DEN). ORO virus has caused extensive outbreaks involving thousands of people. Although some patients were severely ill, there were no fatalities. MAY virus has caused fever with arthralgia and skin rash. Cases of jungle Yellow fever are recorded almost every year; they may occur sporadically or in outbreaks. DEN outbreaks have been reported in Boa Vista, Roraima, involving the serotypes 1 and 4 (Note: this was the first time for 50 years that DEN has been confirmed in Brazil) and in Araguaína, Tocantins where the serotype 2 was incriminated. It is important to emphasize that DEN virus type 2 was first isolated in Brazil from a human travelling from Luanda, Angola, in february 1989. Antibodies to eastern equine encephalomyelitis (EEE), Western equine encephalomyelitis (WEE), and St. Louis encephalitis (SLE), have been found in inhabitants of the region but only SLE has been isolated from humans, without encephalitis.

The maintenance cycles of arboviruses in the Amazon region are often complex, involving wild vertebrates such as primates, birds, rodents, bats, marsupials, sloths as well as reptiles and amphibians. The mosquitoes genera *Haemagogus*, *Culex*, *Aedes*, *Psorophora*, *Sabethes* and *Wyeomyia* are important vectors of arboviruses in the region. *Haemagogus janthinomys* is the principal vector of both MAY and YF. *Culicoides paraensis* is the primary vector of ORO virus during urban epidemics. The only means to solve the problem of epidemic dengue is actually the control of its vector *Aedes aegypti*, since a vaccine is not yet disponible.

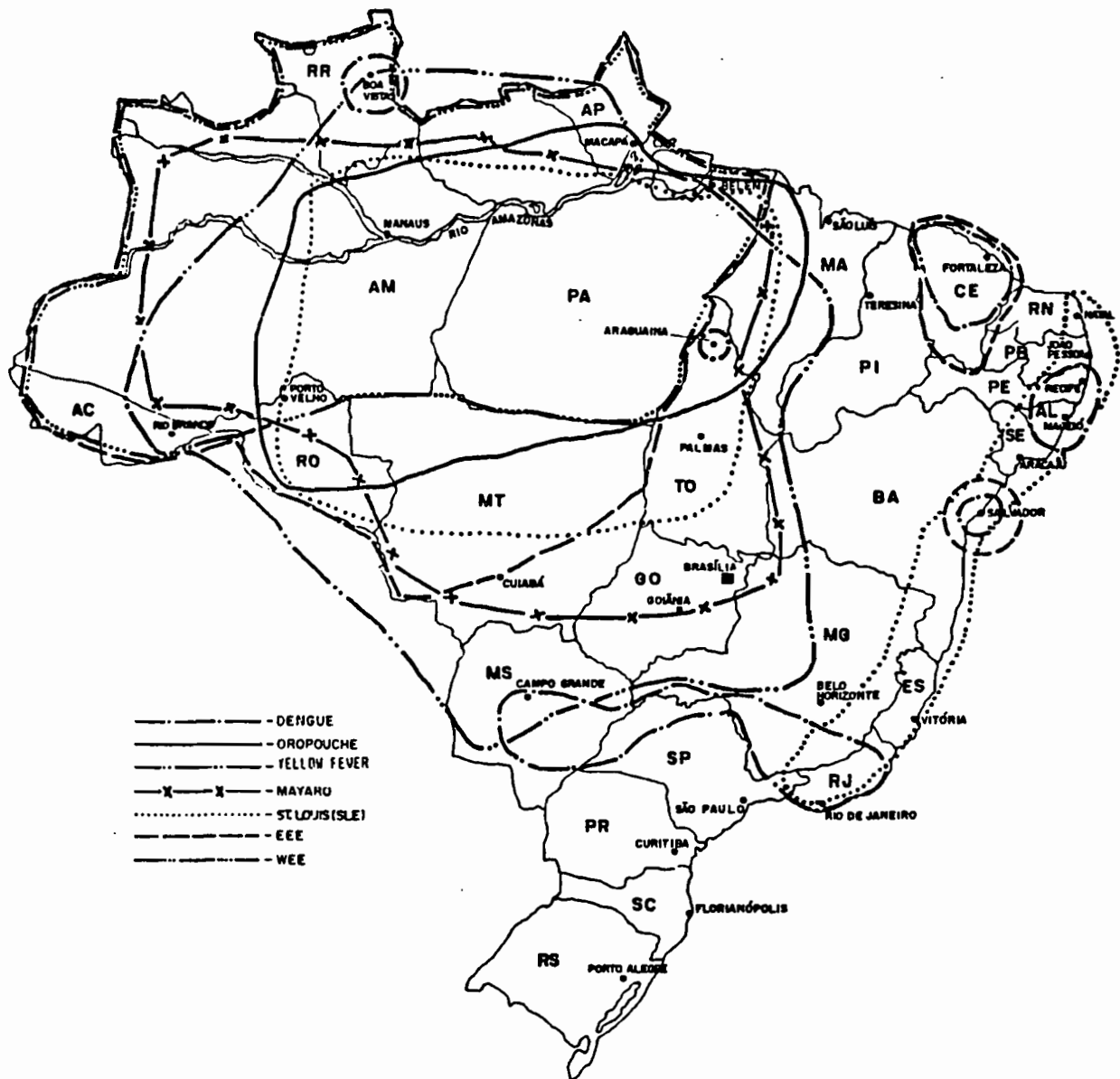


Fig. 1: Areas of YF, MAY, ORO, DEN, SLE, EEE & WEE viruses distribution in the Brazilian Amazon according to data from virological and serological studies at Instituto Evandro Chagas.

H O S T S

INVERTEBRATE

VERTEBRATE

DISEASE IN MAN

MOSQUITO SANDFLIES MIDGES OTHERS HUMANS WILD MAMMALS BIRDS REPTILES OTHERS SENTINELS NATURAL INFECTION LABORATORY INFECTION ANTIBODIES

TRIDAE

*Alphavirus*

Group A

AURÁ*	+																		
EEE	+					+	+			+		+							+
MAYARO	+			+	+	+	+												+
MUCAMBO*	+				+	+	+					+	+						
PIXUNA*	+				+	+												+	
UNA*	+																		
WEE	+								+										+

Ungrouped

TRINITI	+								+										
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IVIRIDAE

*Flavivirus*

Group B

MISSIQUARA*	+				+	+													+
CACIACORÉ*									+										
DENGUE 1	+				+														+
DENGUE 2					+														+
DENGUE 4	+				+														+
YELLOW FEVER	+				+	+													+
ILHEUS	+				+	+	+	+											+
St. LOUIS	+				+	+			+					+					+

AVIRIDAE

*Bunyavirus*

Group Anopheles A

ARUMATEUA*	+																		
CARAÍPÉ*	+																		
LUKUNI	+																		
JACATUMA*	+				+	+	+												+
TROMBETAS*	+																		
TUCURUÍ*	+								+										

Group Bungamvera

IACO*	+																		
KATRI	+								+										
MACAUI*	+								+										
MAGUARI*	+												+						
SOROROCA*	+																		
TUCUNDURA*	+							+											+
IATASSUI*	+																		
XINGU*								+											+

Group C

APEÚ*	+					31	+							+	+				+
CARAPARU*	+						+	+						+	+				+

ITAJUBA*	+			+	+		
MARITUBA*	+			+	+		
MURUTUCU*	+			+	+		
NEPUYO	+				+		
ORIBOCA*	+			+	+		+
RE M 5546*	+			+		+	
<b>Group California</b>							
GUAROA	+			+			+
MELAO	+						
SERRA DO NAVIO*	+						
<b>Group Capim</b>							
ACARA*	+				+		
BENEVIDES*	+				+		
BENEFICA*	+				+		
BUSHBUSH	+				+		
CAPIM*	+				+		
GUAJARÁ*	+				+		
MORICHE					+		
<b>Group Gamboa</b>							
GAMBOA-LIKE	+				+		
<b>Group Guama</b>							
ANANINDEUA*	+			+	+		+
BIMITI	+				+		
CATU*	+			+	+		+
GUAMA*	+			+	+		+
MIRIM*	+				+		
MOJI*	+				+		
TIMBOTEUA*					+		
<b>Group Simbu</b>							
JATORAL*					+		
DROPOUCHE	+	+		+	+		+
UTINGA*					+		
<b>Group Turlock</b>							
TURLOCK	+				+		+
<b>Bunyavirus-like</b>							
<b>Group Pacora</b>							
PACORA-LIKE*					+		
<b>Phlebovirus</b>							
<b>Group Phlebotomus</b>							
ALENQUER*				+			+
AMBE*	+						
ANHANGÁ*					+		
BELTERRA*					+		
BILJAGU*					+		
CANDIRU*				+			+
COARACI*	+				+		
ITAJUBA*					+		
ITAPORANGA*	+				+	+	
JACUNDÁ*					+		
JDA*	+						
MORUMBI*							+
MUNGUBA*	+						



MINA*	+		
UI*	+	+	
PAPARA*	+		
TURUNA*	+		
URIURANA*	+		
URUCURI*	+	+	
AR 485678*	+		
H 505240*		+	+

Ungrouped

BELEM*		+	
MOJUZ DOS CAMPOS*		+	
PARA*			+
SANTAREM*		+	

*virus*

Group Changuinola

ALHEIRIA*	+		
ALTAIRIA*	+		
ARACAIA*	+		
ARATAU*	+		
ARUANIA*	+		
ASSURINIS*	+		
BACAJAIA*	+		
BAKAJAIA*	+		
BALDINA*	+		
CANINDIA*	+		
CANDAL*	+		
COARI*	+		
GORTIRE*	+		
GURUPI*	+		
IRITUBA*		+	
JAMAXI*	+		
JANDIA*	+		
JARI*		+	
JATUARAMA*	+		
JUTAI*	+		
MONTE DOURADO*		+	
MUCURA*	+		
OURI*	+		
PACAJAIA*	+		
PARAKANIA*	+		
PARAMATI*	+		
PARAUPEBAS*		+	
PARU*	+		
PEPENDANA*	+		
PINDORAI*	+		
PIRATUBA*	+		
PUSUS*		+	
SARACAIA*	+		
SURUBIM*	+		
TAPIROPÉ*	+		
TIMBOZAL*	+		
TOCANTINS*	+		
TRACAMBE*	+		
TUERE*	+		
TUMUCUMAQUE*	+		
UATUBA*	+		
UXITUBA*	+		

AR 446985*	+
AR 447024*	+
AR 490492*	+
AR 490496*	+
AR 491065*	+
AR 495605*	+
AR 496008*	+
AR 496014*	+
AR 496021*	+
AR 496034*	+
AR 498935*	+
AR 502545*	+
AR 505169*	+
AR 505170*	+
AR 505171*	+
AR 505172*	+

Group Corriparta

ACADO-LIKE*	+
JACARECANGA*	+

Ungrouped

IERI	+
ITIUPIRANGA*	+
TEMBE*	+

RHABDOVIRIDAE

*Vesiculovirus*

Group Hart Park

MOSQUEIRO*	+
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Group Kwatta

KWATTIA-LIKE*	+	+
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Group Mossuril

CUABÁ*			+
MARCO*			+

Group Timbo

CHACO*				+
SENA MADUREIRA*				+
TIMBO*				+

Group V.S.V.

CARAJAS*	+				
COCAL		+			
JURONA*	+		+		+
MARABÁ*		+			
PITY*			+		

Ungrouped

ARUAC	+	
INHANGAPÍ*		+
XIBUREMA*	+	

ARENAVIRIDAE

*Arenavirus*

Group Tacaribe

AMAPARI*	+	34	+
ARAGUARI*			+

					+	+		+
	Ungrouped							
	AGUA PRETA*							+
	Ungrouped							
	COTIA-LIKE*							+
AMYXOVIRIDAE	Ungrouped							
	MAFIERA*							+

CLASSIFIEDS								
	Ungrouped							
	CAJAZEIRA*							+
	CODAJÁS*		+					
	GALIBI*		+					
	ITACAIUNAS*					+		
	IRIRI*			+				
	JURUACA*							+
	PAPURA*			+				
	PARIXÁ*							+
	TROCARA*		+					
	AR 478792*		+					
	AR 492347*		+					

TOTAL 181

\* Isolated at 1st. time in Brazil 157

--- Confirmed as new types to the world 87



# ARTHROPOD-BORNE VIRUS INFORMATION EXCHANGE

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