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ANOPHELES (NYSSORHYNCHUS) DEANEORUM: A NEW SPECIES IN THE *ALBITARSIS* COMPLEX (DIPTERA: CULICIDAE)

MARIA GORETI ROSA-FREITAS

Instituto Oswaldo Cruz, Departamento de Bioquímica e Biologia Molecular, Caixa Postal 926, 20001 Rio de Janeiro, RJ, Brasil

Anopheles (Nyssorhynchus) deaneorum *sp. n. is described from specimens collected in Guajará-Mirim, Rondônia state and Rio Branco, Acre state, Brazil, on human and animal baits, inside dwellings and from the progenies of engorged females. A detailed description of the shape of egg, external appearance of adult female and male, genitalias, female cibarial armature and complete chaetotaxy of pupa and larva show that it can be distinguished from* Anopheles albitarsis *from the type-locality and other areas by the paler general external appearance of the adult, the postero-lateral tufts of scales on the female abdominal terga and the branching of the outer anterior clypeal seta (3-C) of the fourth instar larva (as shown in illustrations). It species can also be distinguished from* An. albitarsis *from the type locality by the allele frequencies at 11 enzymic loci as represented by Nei's Genetic Distance.*

Key words: *Anopheles (Nyssorhynchus) deaneorum* sp. n. – mosquito – Culicidae – Brazil – *Anopheles albitarsis* complex

Anopheles deaneorum is a new species closely related to *An. albitarsis* sensu strictu Lynch-Arribálzaga, 1878 (neotype designated and described by Rosa-Freitas & Deane, 1989), differing mainly by the pale general external appearance of the adult, by the branched outer anterior clypeal seta (3-C) of larval stage and by the presence of postero-lateral tufts of scales begining only on abdominal terga IV or V of female (Figs 1-4).

The name of this species is given in homage to Professors Leonidas W. Deane and Maria P. Deane who, in the late 1940s while working in Guajará-Mirim, Rondônia state, first observed populations with those differential characters (Deane et al., 1948).

In 1984 we began our studies on what had been regarded as the *albitarsis* complex. We compared populations from 9 Brazilian localities and the type-locality of Baradero, Argentina, using morphology and isoenzymes. We were able to find morphological distinctness only in the Guajará-Mirim (Rondônia state) and Rio Branco (Acre state) populations, both sharing the same characteristics. Guajará-Mirim was elected the type-locality for *An. deaneorum* for being the first place where differences were observed. However, as Rio Branco was also extensively studied, the results from this area, when differences appear, will also be shown in this paper. Isoenzymatic studies using agarose gel electrophoresis and homogenates of fourth instar larvae in 11 loci also led to the separation of these two populations from the rest.

The terminology utilized is that of Harbach & Knight (1980, 1981).

FEMALE – (Fig. 4). *Head.* Vertex with darkish integument with narrow pale scales; side of eyes with falcate white scales; apically truncate, spatulate scales numerous, pale yellowish; ocular and interocular setae lengthy; 3 long pairs of setae near frons on the interocular space; numerous darkish apically truncate spatulate scales on the postgena. Proboscis darkish with several falcate darkish scales; labellum clear with few small apically rounded spatulate scales; basal bristles brown.

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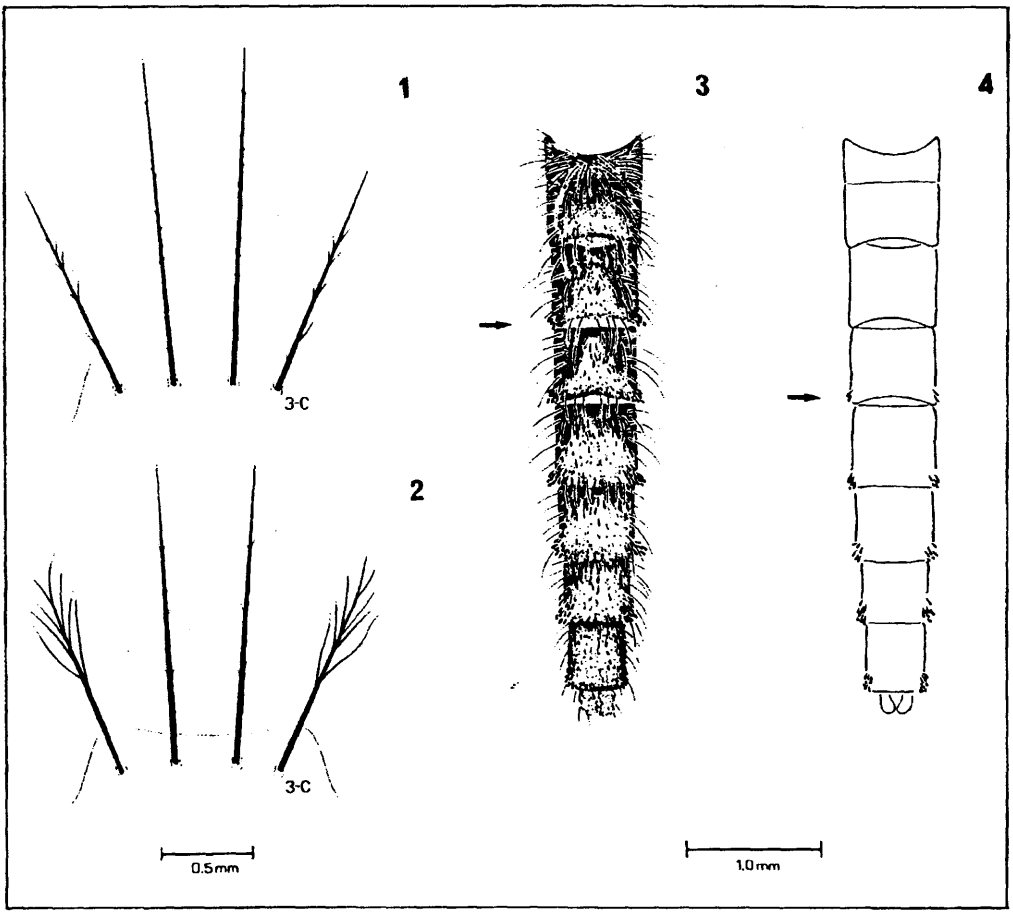


Anopheles deaneorum sp. n. Fig. 1: aciculate outer anterior clypeal hairs of 4th instar larvae of *Anopheles albitarsis* from Baradero. Fig. 2: branched clypeal hairs of *An. deaneorum* from Guajará-Mirim and Rio Branco. Fig. 3: abdominal segments showing the insertion of posterolateral tufts of black scales beginning in 3rd tergite for *albitarsis*. Fig. 4: in the 4th or 5th tergite for *deaneorum*.

Maxillary palpus as long as proboscis and covered with white and dark apically rounded spatulate and falcate scales and a few setae. First palpomere entirely covered by dark scales; second palpomere with dark apically rounded spatulate scales including a few scattered white scales and with a white ring of scales at apex; third palpomere essentially the same as the second; fourth palpomere with dark falcate scales, white scales forming a spot in the middle; fifth palpomere entirely white. *Cibarial armature.* Cibarial ridge concave with 2 to 4 lateral rods and about 8 to 10 large, columnar cibarial teeth, serrulated at apex. *Thorax.* Scutum with integument gray with 4 darker areas: a line across the achrostical region, two sickle shaped spots symmetrically situated at the end of the prescutal suture and a triangle shaped spot in the prescutellar area; scutum covered by falcate yellowish scales, narrower falcate scales in the anterior promontory area. Scales are lacking in 2 bare stripes each side, one in the anterior dorsocentral area, the other at the side of the posterior dorsocentral area. Scutal setae, such as those which follow the scale distribution, brown, almost all strong, long and curved. Scutellar scales yellowish falcate, strong brown setae with a few small; scales and setae homogeneously distributed on the scutellar margin. Antepronotum with brown setae and darkish scales with a few white. Postpronotum without scales or setae; integument brown with darkish areas in the upper and lower postpronotal regions. Pleural sclerites with brown integument with darkish and pale areas. There are distinct pale areas on

pleuron: on lower margin of the mesepimeron, on the middle and lower margin of the mesokatepisternum, on the lower margin of the mesomeron. The darkish areas are on the upper margin of mesepimeron, mesokatepisternum and in the postspiracular and anterior areas of the postpronotum. Pleural setae brown; pleural scales small, apically rounded, spatulate, yellowish; upper mesepimeral scales normally grouped as 6; generally 4 in the prealar region of the mesokatepisternum, usually 5 in the upper mesokatepisternal area in the darkish area of the integument as well as in the lower mesokatepisternal area. Setae usually situated in the same area of the scales; upper proepisternal area with 2 or 3 strong and dark setae in the median region without associate scales; a few, usually 2 or 3, in the prealar region of the mesokatepisternum and 2 or 3 in the upper mesepimeral area; in the upper mesokatepisternum 2 or 3 are also observed; generally 1 occasionally 2 in the lower mesokatepisternum. Metepisternal integument brownish. Mesopostnotum nude brownish. *Wing.* Upper calypter with a complete fringe of long pale setae; remigium pale with spatulate white scales. Costal dark spots of the wing distributed in 7 different patterns in 30 specimens, 20 females, 10 males (23 females, 7 males in Rio Branco) studied. The first and most frequent pattern had the basal, prehumeral, subbasal, median and preapical spots (11 specimens in Guajará-Mirim and 10 in Rio Branco); the second pattern presented the 2 first dark basal and prehumeral spots very small lenghty (2 specimens in Guajará-Mirim and 1 specimen in Rio Branco); the third pattern had similar spots as the first except for absence of the basal spot (9 specimens in Guajará-Mirim, 16 specimens in Rio Branco); the fourth pattern did not have the basal and prehumeral spots (1 specimen in Guajará-Mirim and 1 in Rio Branco); the fifth pattern had the prehumeral, humeral, presector, median and preapical dark spots (5 specimens in Guajará-Mirim and 3 specimens in Rio Branco); the sixth had the same spots as the previous pattern added by the basal dark (2 specimens, none in Rio Branco); the seventh pattern had a large dark spot as a result of the fusion of subbasal and median dark spots (1 specimen in Guajará-Mirim, none in Rio Branco). Veins 3 and 6 as in all *Nyssorhynchus* subgenus present 1 spot near distal and proximal extremities respectively. Other veins (1, 2, 4 and 5) with variable number of dark spots. Vein 1 had 5 dark spots as more frequent (also 3 and 4 spots); vein 2 with R2 and R2 + 3 having 6 (also 2, 3, 4, 5 and 7 spots) and R3 having 1 and 2 dark spots in the same proportion (also without spots); vein 4 with M1 having 3 (also 2, 4, 5 and 6 spots) and M2 with 1 (also 2); vein 5 with Cu anterior and M3 + 4 having 4 (also 2 and 3) and Cu posterior having 1. *Halter.* Scabellum and pedicel pale, capitellum with dark and a few white scales. *Legs.* Coxae with darkish integument, yellowish spatulate scales and long setae; inner side of the hindcoxa with a pale area. Trochanters, femora, tibiae and tarsi covered with white and black spatulate and falcate scales and spines distributed as in *albitarsis.* Variable percentage of black scales on the basal portion of second hindtarsomere. Thirty three specimens were analysed for this character. According to type of capture results were: on horse the average was 67.8% black (s = 6.61); on human 54.1% (s = 3.99) and indoors it was 67.0% (s = 3.74). Among all groups 62.9% is the average and percentage of blackness ranged from 50.0% to 83.9% (in Rio Branco 64.6% is the average and the range was 40.0% to 85.0% in 69 specimens). Third, fourth and fifth hindtarsomeres entirely white. *Abdomen.* Integument dark, covered by long and curved setae and yellowish apically round spatulate and falcate scales. White falcate scales distributed in the median area of terga II to VIII, forming triangles until tergum IV where they increase covering almost all the dorsal surface; tergum I without scales. Posterolateral tufts formed of apically truncate spatulate dark scales from terga IV or V to VIII (Fig. 4), some specimens present 1 or 2 scales on each side of tergum IV, not being regarded as a true tuft. Sternum I with double row of white apically rounded spatulate scales U shaped. Sternal scales whitish contrary to yellowish scales from terga. Sterna covered by scattered whitish falcate scales distributed as a triangle with dark scales in the middle, sometimes absent. The amount of scales increase in the terminal segments. *Genitalia.* Tergum IX spiculose. Postgenital lobe short, roughly triangular shaped with two strong setae. Cercus elongate, spiculose with numerous apically truncate scales and long setae. Insular setae small, about 20, distributed in a circle. One spermathecal capsule with numerous pores.

MALE. In general as described for female, except for the sexual differences. Antenna very plumose, about 0.65 of the proboscis length. Maxillary palpus apically rounded, club shaped

entirely covered with white and black spatulate scales with a few long setae in the distal portion of the third palpomere; palpomere I with blackish scales; second palpomere with a few whitish scales scattered in the middle and laterally and a whitish ring of scales in the distal portion; third palpomere with two white rings in the proximal and distal portion respectively, entirely black between; fourth palpomere with a spot of yellowish scales in the middle surrounded by blackish scales, a stripe of white scales in the distal portion; fifth palpomere with a basal white stripe, then black up to the middle; apex entirely white. *Genitalia. Segment IX* ring shaped, open in the ventral face; cuticula covered by numerous small spicules. *Gonocoxite* elongate with numerous spatulate scales and strong and long setae in the tergal surface extending to the lateral of the sternal surface; cuticula with lateral sternal surface with numerous spatulate scales and strong and long setae in the middle, minute setae in the inner surface. Spiculose cuticula except below insertion of the accessory setae where there is a nude triangular area. Parabasal lobe bearing a rod-like seta 1/3 size of the two accessory setae which are rod-like and apically bent; internal seta long and curved; below accessory setae there is the claspette insertion with the membranous leaf-like scale. *Gonostylus* slender, curved with a row of minute setae on the inner surface; a simple larger seta is inserted before the gonostylar claw. Phallossome: basal lobule membranous; aedeagus cylindrical without setae or scales; strongly sclerotized areas in lateral surfaces; apically rounded at apex.

EGG. Under the scanning electron microscopy the exochorion is formed by globular tubercles interconnected by filaments upon a base formed by small globular particles distributed homogeneously on a dark integument. Floats formed by about 20 ridges and continued to the anterior and posterior extremities by a ribbed and narrow frill. Endochorion formed by both small and large star-shaped tubercles.

LARVA. Complete chaetotaxy as plotted in Table I. Head pale except for the pigmented area symmetrically situated in lateralia; anterior tentorial arm complete; hypostomal suture incomplete not reaching the collar; collar strongly pigmented. Outer anterior clypeal seta (3-C) branched (Fig. 2). Clypeal index 1.00-1.40. Dorsomentum with 3 teeth on each side of a median developed tooth. Ventromentum with 2 teeth on each side of two median developed teeth. Antenna lengthened, more densely spiculose on inner surface. Thorax roughly square shaped. Abdominal tergal plates squared, strongly pigmented from segment I to VIII. Palmate seta 1-II-VII with the apex truncate. Pecten with 15 spines with about 4 bigger. Spiracular apparatus with anterior spiracular lobe diamond shaped with a hole through which the anterior median process is seen; small anterolateral spiracular lobe with a simple seta in the apex; spiracular opening round shaped; median plate more pigmented in the middle. Segment X with pilose cuticula; saddle incomplete, brownish with a single seta; grid with 8 pairs of pectinate setae. Anal papillae long and slender, longer than saddle.

PUPA. Complete chaetotaxy as listed in Table II. Trumpet heavily dark pigmented, spiculose, pinna angusticorn shaped. Metathorax with a round spot each side of dorsal surface. Paddle nearly twice as long as segment VIII; slightly serrated from the apex until near the middle of the lateral margin; ovate, rounded at apex, pale; midrib and buttress not well developed, slightly darker than the general tone of paddle. Genital lobe as pigmented as the midrib.

Type data – Holotype ♀, allotype ♂ and paratypes deposited in the Costa Lima Entomological Collection of the Oswaldo Cruz Institute. Holotype 2C1*1 (number 6171), Guajará-Mirim, Palheta, 10°46'59"S, 65°20'22"W, Rondônia State, Brazil; progeny from a female caught on horse, P. S. Souza col., 30/07/86. Allotype 3C2*1 (number 6172); Paratypes 4 female (2H3*4, 2D3*1, 3C2*2, 2H3*1) and 4 males (2C1*5, 2C1*4, 3C2*1, 2H3*6) numbers 6173-6179. Material from Rio Branco (Plácido de Castro), Acre state. 3 females and 3 males (numbers 6180-6185). Larval, pupal skins, male and female genitalia and cibarial armature mounted on slides are also deposited (numbers 5591-5619). Material were also deposited in the Entomological Collection of the Department of Epidemiology of the Faculty of Public Health, São Paulo University and United States National Museum Collection.

Distribution – Larvae and adults possessing the characteristics cited above were reported in Guajará-Mirim (Rondônia state; Deane et al., 1948; Rosa-Freitas et al., 1987), Rio Branco

TABLE I

Complete chaetotaxy of larvae of *Anopheles deaneorum* from Guajará-Mirim

Seta	Head	Antenna	Thorax			Abdomen								Spiracular Apparatus	X
			P	M	T	I	II	III	IV	V	VI	VII	VIII		
0	A –	–	–	–	–	–	4-8(6)	6-9(6, 7)	5-9(6, 7)	5-8(7)	3-6(5)	3-6(4)	3-5(4)	–	–
	H –	–	–	–	–	–	5-9(8, 9)	6-9(8)	7-8(7)	5-7(6)	3-6(5, 6)	3-5(3)	4(4)	–	–
	D –	–	–	–	–	–	5-9(6)	5-9(5, 6, 9)	6-8(6)	4-8(7)	4-7(5)	4-6(4)	3-5(4)	–	–
1	1	5-8(6)	Palmate	Plumose	1	Palmate	Palmate	Palmate	Palmate	Palmate	Palmate	Palmate	1	5-8(5, 6)	1
	1	5-9(6)	Palmate	Plumose	1	Palmate	Palmate	Palmate	Palmate	Palmate	Palmate	Palmate	1	3-8(5)	1
	1	5-8(7)	Palmate	Plumose	1	Palmate	Palmate	Palmate	Palmate	Palmate	Palmate	Palmate	1	5-8(7)	1
2	Aciculate	1	Plumose	1	1	3-4(3, 4)	3-5(3)	3(3)	1(1)	1	2-5(3)	4-7(5)	9-12(9)	5-8(5, 6)	Plumose
	Aciculate	1	Plumose	1	1	3-4(3)	3-5(3, 4)	2-4(3)	1(1)	1	2-3(3)	4-6(5)	10-12(11, 12)	5-7(5, 6)	Plumose
	Aciculate	1	Plumose	1	1	3(3)	3-5(3)	3(3)	1-3(1)	1	2-3(3)	4-6(5)	10-13(12)	5-7(5)	Plumose
3	Branched	1	1	1	Palmate	1	1(1)	1	2-3(3)	1	1	2-3(3)	10-13(13)	–	Plumose
	Branched	1	1	1	Palmate	1	1(1)	1	2-3(3)	1	1	2-3(3)	9-14(12)	–	Plumose
	Branched	1	1	1	Palmate	1	1-2(1)	1	2-3(3)	1	1	2-3(3)	6-14(11, 12)	–	Plumose
4	2-4(2)	2(2)	Plumose	3-6(5)	3-4(3)	4-7(5)	4-5(5)	2-4(3)	2-4(3)	2-3(3)	1	1	1	–	Plumose
	2-5(2, 3)	2(2)	Plumose	3-5(5)	3(3)	4-7(4)	4-6(5, 6)	2-4(3)	2-4(3)	2-3(3)	1	1	1	–	Plumose
	2-6(2)	2-3(2)	Plumose	4-5(5)	2-4(3)	4-7(4)	4-6(5, 6)	3(3)	2-4(3)	2-3(3)	1	1	1	–	Plumose
5	Plumose	1	Plumose	1	Plumose	4-6(5)	10-14(10)	8-18(13, 15)	5-8(5, 6)	5-8(7)	6-8(7)	6-9(7, 9)	5-8(7)	–	–
	Plumose	1	Plumose	1	Plumose	4-5(5)	7-14(9)	9-14(12)	5-9(5)	5-9(6)	6-9(8)	6-9(7, 8)	5-8(7)	–	–
	Plumose	1	Plumose	1	Plumose	4-5(5)	9-16(9)	7-15(12, 13)	4-6(5)	5-8(6)	6-9(7)	6-11(9)	6-11(6)	–	–
6	Plumose 9-14(11, 13)	1	1	3-4(3)	2(2)	Plumose	Plumose	Plumose	1	1	1	4-6(4)	–	1-2(2)	–
6mx	Plumose 9-14(10, 14)	1	1	2-3(3)	2-3(2)	Plumose	Plumose	Plumose	1	1	1	4(4)	–	2(2)	–
	Plumose 11-15(11, 12, 13)	1	1	3-4(3)	2-3(3)	Plumose	Plumose	Plumose	1	1	1	4-5(4)	–	1-2(2)	–
7	Plumose	–	Plumose	3-4(3)	Plumose	Plumose	Plumose	2-5(3)	3-5(4)	3-4(3)	2(2)	3-6(4, 6)	–	1(1)	–
	Plumose	–	Plumose	2-5(4)	Plumose	Plumose	Plumose	3-4(3)	3-4(3, 4)	3(3)	2-3(2)	4-6(4, 5, 6)	–	1(1)	–
	Plumose	–	Plumose	3-4(3)	Plumose	Plumose	Plumose	2-4(3)	3-4(3)	2-3(3)	2-3(2)	4-6(4)	–	1-2(1)	–
8	3-6(4)	–	Plumose	Plumose	Plumose	–	3-4(4)	3-4(4)	3-4(4)	3-4(3)	2-4(3)	4-8(5)	–	5-6(5)	–
	3-6(4)	–	Plumose	Plumose	Plumose	–	3-5(3, 4)	3-5(4)	3-4(3)	3(3)	3-4(3)	4-6(4, 5, 6)	–	4-6(4, 5)	–
	3-6(4)	–	Plumose	Plumose	Plumose	–	3-5(4)	3-5(4)	3-4(3)	3-4(3)	3(3)	5-8(4)	–	4-7(5)	–
9	3-6(3)	–	1	1	1	5-7(7)	7-9(8)	6-10(7)	6-10(9)	6-11(7)	8-11(9)	6-10(8, 9)	–	4-5(4)	–
	2-5(3)	–	1	1	1	6-8(8)	8-11(8, 9)	8-11(9, 11)	7-10(8, 9, 10)	8-11(8)	8-11(9)	6-10(8)	–	3-7(4)	–
	3-6(3)	–	1	1	1	5-8(5)	7-10(9)	8-11(11)	6-10(9)	6-12(8, 10)	8-13(9)	7-10(8)	–	4-5(5)	–
10	2-3(3)	–	1	1	1	1	2-3(2)	1	1	1	2-3(3)	4-5(5)	–	–	–
	3(3)	–	1	1	1	1	2-3(2)	1	1	1	2-3(2)	3-5(4, 5)	–	–	–
	3-4(4)	–	1	1	1	1	2-3(3)	1	1	1	1-3(2)	3-5(5)	–	–	–
11	Plumose	–	2	1	1	3-4(3)	1	2-3(2)	2-3(2, 3)	2-3(2)	2(2)	2(2)	–	–	–
	Plumose	–	2	1	1	3-4(3)	1	2-3(2)	1-2(2)	1-2(2)	2(2)	1-2(1, 2)	–	–	–
	Plumose	–	2	1	1	3(3)	1	2-3(3)	2(2)	1-2(1)	2-3(2)	1-2(1)	–	–	–
12	4-6(5)	–	1	1	2-3(2, 3)	2-3(2)	1	2-3(2)	2-4(2, 3)	2-3(2)	1(1)	1(1)	–	–	–
	4-6(4)	–	1	1	2(2)	1-2(2)	1	2-3(2)	2(2)	2(2)	1(1)	1-2(1)	–	–	–
	4-6(4, 6)	–	1	1	2-3(2)	2(2)	1	2-3(2)	2-3(2, 3)	2(2)	1-3(1)	1-2(1)	–	–	–
13	5-7(5)	–	3-5(3)	5-9(5)	2-3(2)	5-7(6)	7-11(10)	3-7(5)	4-7(4)	5-6(5)	8-12(11)	4-5(5)	–	–	–
	5-6(5)	–	3-5(4)	5-7(5)	2-3(2)	4-6(5)	9-12(10)	4-9(4, 7)	3-5(4)	3-7(5)	8-13(10, 11)	4-7(5)	–	–	–
	5-7(5)	–	4-6(5)	4-7(4, 5, 6)	2-3(2, 3)	4-7(5)	8-13(11)	3-8(4)	3-5(4, 5)	5-8(5)	8-13(9, 10, 12, 13)	4-6(5)	–	–	–
14	5-7(5, 6, 7)	–	8-10(9)	7-11(9, 10, 11)	–	–	1	1	1	1	1	–	1	–	–
	5-7(6)	–	9-12(9)	8-12(11)	–	–	1	1	1	1	1	–	1	–	–
	5-7(7)	–	6-10(8, 10)	9-12(11),	–	–	1	1	1	1	1	–	1	–	–
15	3-6(5)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	5-6(6)	–	–	–	–	–	–	–	–	–	–	–	–	–	–
	5-10(7)	–	–	–	–	–	–	–	–	–	–	–	–	–	–

Range of number of branches with mode in parenthesis (A – animal, H – human and D – dwelling).

TABLE II

Complete chaetotaxy of pupae of *Anopheles deaneorum* from Guajará-Mirim

Seta	Cephalothorax	Metathorax	Abdomen								
			I	II	III	IV	V	VI	VII	VIII	
0	A –	–	–	5-7(5)	4-6(5)	3-5(4)	3-5(4)	4-6(4)	3-5(3)	1(1)	
	H –	–	–	4-5(5)	4-7(5)	4-6(4)	3-5(4)	3-6(4, 5)	2-5(4)	1(1)	
	D –	–	–	3-6(5, 6)	4-6(5)	4-5(5)	3-5(4)	3-5(4)	3-4(4)	1-2(1)	
1	2-3(3)	–	Dendritic	7-10(8)	4-8(6)	1	1	1	1	1	1
1 Paddle	2-3(2, 3)	–	Dendritic	5-10(7, 8)	1-7(5, 6)	1	1	1	1	1	1
	2-3(3)	–	Dendritic	6-11(9)	5-11(5)	1	1	1	1	1	1
2	3(3)	–	3-5(3)	3-6(5)	4-5(5)	2-3(2, 3)	2-3(2)	1-3(2)	1(1)	–	1-2(2)
2 Paddle	2-3(3)	–	4-7(6)	4-7(5)	3-6(5, 6)	2-3(2)	1-4(2)	1-2(2)	1(1)	–	1-2(1)
	2-3(2, 3)	–	3-5(3, 5)	3-6(4, 5)	3-5(3, 4)	2-3(2)	2-3(2)	2(2)	1-2(1)	–	1(1)
3	2-3(3)	–	1-3(1)	1	1	3-6(4)	2-4(3)	2(2)	2-3(2)	–	
	2-4(3)	–	1-2(1)	1	1	3-5(5)	2-4(3)	1-2(2)	2-4(3)	–	
	2-3(3)	–	1(1)	1	1	4-6(4, 5)	2-3(2)	2-3(2)	2-3(2, 3)	–	
4	2-3(2, 3)	–	3-6(5)	3-5(4)	3-5(4)	3-5(3)	2-4(3)	2-3(3)	1-2(1)	2-4(3)	
	2-4(3)	–	3-7(4, 6)	3-5(4)	2-5(4)	3-4(3, 4)	3-5(4)	2-3(2)	1-3(3)	2-3(3)	
	2-3(3)	–	5-6(5, 6)	4-5(4)	3-4(3)	2-5(3)	2-3(3)	1-3(2)	1-2(2)	2-4(2, 3)	
5	3-5(5)	–	2-3(3)	4-5(4)	6-10(8)	2-6(3)	1	1(1)	1	–	
	4-6(3, 4)	–	2-3(2)	3-5(5)	5-11(9)	1-6(4)	1	1-2(1)	1	–	
	3-4(3, 4)	–	2-3(3)	3-6(4)	5-9(5)	2-5(2)	1	1(1)	1	–	
6	2-3(3)	–	1	1-2(1)	3-5(3)	2-3(2)	2-3(2)	2(2)	1(1)	–	
	2-5(3)	–	1	1(1)	1-4(3)	2-3(2)	1-2(2)	1-3(2)	1(1)	–	
	3(3)	–	1	1-2(1)	2-4(2)	2-3(2)	2(2)	1-2(2)	1-2(1, 2)	–	
7	2-4(2)	–	4-5(4)	3-4(3)	2-3(3)	3-4(3)	2-4(3)	1-2(1)	1-2(1)	–	
	1-3(2)	–	3-7(4)	1-5(4)	2-4(3)	3-5(3)	2-4(3)	1-2(1)	1-2(1)	–	
	1-2(2)	–	3-5(3, 4, 5)	3(3)	1-4(2, 3)	3-4(3)	2-4(3)	1(1)	1-2(1)	–	
8	1	–	–	–	1-3(3)	1-4(2)	1-2(2)	1-3(2)	3-5(3)	–	
	1	–	–	–	2-4(3)	2-4(2)	1-3(2)	1-3(2)	3-5(3)	–	
	1	–	–	–	2-5(3)	1-3(2)	1-2(1)	2-3(2)	3-5(3, 4)	–	
9	2-3(3)	–	1	1	1	1	1	1	1	1	
	2-3(2)	–	1	1	1	1	1	1	1	1	
	2-3(2)	–	1	1	1	1	1	1	1	1	
10	–	1(1)	–	–	1-3(3)	1	1	0	1-3(3)	–	
	–	1-2(1)	–	–	1-4(2)	1	1	0	1-3(2)	–	
	–	1(1)	–	–	1-3(3)	1	1	0	1-3(2)	–	
11	–	3-4(3)	–	–	1(1)	1-2(1)	1-2(1)	1	1-2(1)	–	
	–	3-4(3)	–	–	1(1)	1(1)	1(1)	1	1-2(1)	–	
	–	2-5(2,3)	–	–	1-2(1)	1(1)	1(1)	1	1-2(1)	–	
12	–	2-4(3)	–	–	–	–	–	–	–	–	
	–	3-5(3)	–	–	–	–	–	–	–	–	
	–	2-3(3)	–	–	–	–	–	–	–	–	
14	–	–	–	–	1	1	1	1	1	1	
	–	–	–	–	1	1	1	1	1	1	
	–	–	–	–	1	1	1	1	1	1	

Range of number of branches with mode in parenthesis (A – animal, H – human and D – dwelling).

(Acre state; Rosa-Freitas et al., 1987), Costa Marques (Rondônia state; T. Kline pers. comm.), Ariquemes (R. Lourenço-de-Oliveira and Marcia G. Castro, pers. comm.).

Material examined – *Anopheles deaneorum* sp. n. Guajará-Mirim (Rio Branco in parenthesis): 10 (7) males, 20 (23) females for wing banding pattern; 33 (64) males, 33 (69) females for % black scales on the 2nd hind tarsomere; 6 male genitalia, 4 female genitalia, 10 (10) larvae, 10 (10) pupal skins and 3 cibarial armature.

Taxonomic discussion - *Anopheles albitarsis* neotype ♀ was previously described (Rosa-

Freitas & Deane, 1989) providing type-locality specimens with which *Anopheles deaneorum* can now be compared. *Anopheles deaneorum* is morphologically very similar to *Anopheles albitarsis* except for: (i) the paler colour of the cuticula and wings; (ii) the postero-lateral tuft of scales on abdominal terga IV or V contrary to *albitarsis* in which it begins on III (Figs 3 and 4), II having only one or two scales that can not be considered a true tuft; (iii) the branched outer anterior clypeal setae (3-C) of the fourth instar larva contrary to *albitarsis* in which they are just aciculate (Figs 1 and 2).

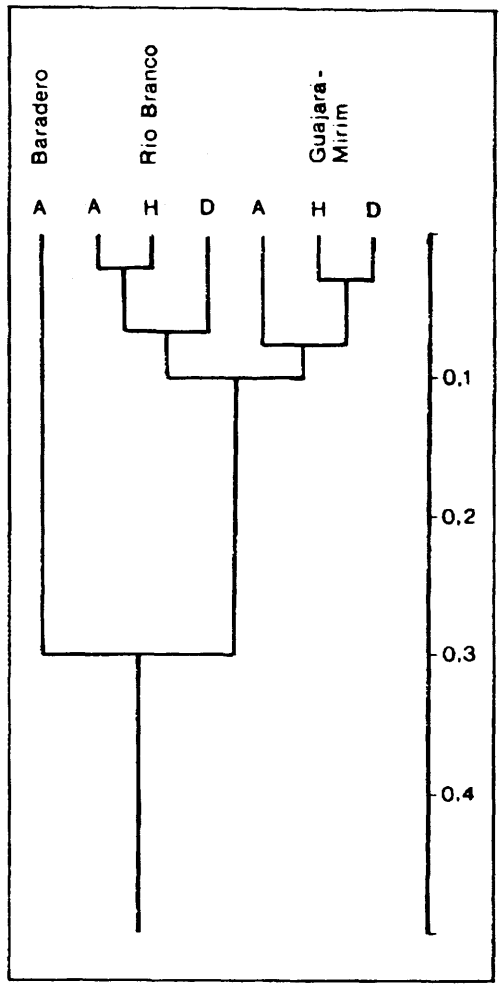
Guajará-Mirim forms a population which has 7 different patterns in wing costal spots, the highest polymorphism, when compared to 9 other populations including Baradero (Rio Branco showed only 4 patterns). The presence of the presector pale spot that splits subbasal dark spot in humeral dark and presector dark was present in 7 specimens in Guajará-Mirim (3 in Rio Branco), but absent only in Baradero and São Borja (Rio Grande do Sul state). Nevertheless, this characteristic can not be considered as exclusive or reliable because it had already been reported by Davis (1928) in 0.6% of the Argentinean specimens studied by him. Besides, Umana et al. (1959) found specimens without subcostal pale, a characteristic not found by us. The absence of the sector pale, which fuses subbasal and median, is one of the melanotic types seen in the type-locality, Baradero with 7 specimens. This characteristic was not seen in the other 8 populations studied except for São Borja with 8 specimens.

There are no reports of finding natural infection in Guajará-Mirim and Rio Branco populations neither by active search of sporozoites in salivary glands and oocysts in stomachs nor by ELISA and IRMA immunological methods.

Females did not show feeding preferences. Of specimens collected 30% were from animal bait outdoors, 32% from human bait outdoors and 38% from human bait indoors (35%, 48% and 17% respectively in Rio Branco).

In the isoenzymatic study the agarose gel electrophoresis technique as described in Salles et al. (1986) was used with homogenates of 4th instar larvae.

Enzyme bands showing similar mobility were considered the same electromorph (allele).



Anopheles deaneorum **sp. n. Fig. 5: dendrogram representing values of Nei's genetic distance given in Table III.**

Electromorphs were numbered according to anodic mobility, i. e., towards positive pole. The nearest cathodic electromorph was numbered 1, the following 2 and so on. Up to 3 different electromorphs were found in the 10 populations studied. Malic enzyme (ME – Enzyme Comission no. 1.1.1.40), isocitric dehydrogenase (IDH – E.C.1.1.1.42), hexokinase (HK – E.C.2.7.1.1), and the two phosphoglucomutases (PGM1 and PGM2 – E.C.2.7.5.1) had 3 electromorphs; fumarase (FUM – E.C.4.2.12), peptidases (PEPD and PEP2 – E.C.3.4) and glucose phosphate isomerase (GPI – E.C.5.3.1.9) had 2 electromorphs and mannose phosphate isomerase (MPI – E.C.5.3.1.8) and malic dehydrogenase (MDH – E.C.1.1.1.37) were monomorphic. These enzymes

TABLE III

Data of Guajará-Mirim, Rio Branco and Baradero taken from a Nei's genetic distance matrix calculated for all 10 populations of *albitarsis* and *deaneorum*

		Guajará-Mirim			Rio Branco			Baradero
		A	H	D	A	H	D	A
Guajará-Mirim	A:	0.000						
Guajará-Mirm	H:	0.092	0.000					
Guajará-Mirim	D:	0.063	0.031	0.000				
Rio Branco	A:	0.081	0.038	0.052	0.000			
Rio Branco	H:	0.094	0.207	0.093	0.024	0.000		
Rio Branco	D:	0.147	0.081	0.177	0.028	0.109	0.000	
Baradero	A:	0.336	0.440	0.452	0.299	0.111	0.267	0.000

belong to 5 enzymatic classes: oxidoreductases (ME, IDH, MDH), transferases (HK, PGM), hydrolases (EST, PEPD, PEP2), lyases (FUM) and isomerases (MPI, GPI). Data from the allelic frequency of the homozygotes and the heterozygotes, inferred through electromorphs for the 11 loci were used to calculate the Nei's Genetic Distance (D) between populations (Table III) using the NEI software program (R. Cibulskis, Liverpool School of Tropical Medicine). The genetic distance matrix produced by this program was transformed into a dendrogram by using the 4M software program (C. H. Buchholtz & S. Weller, Pensilvannia University) using mean distances (group average) between groups and maximum distances (complete linkage) to break ties (Fig. 5).

The genetic distance (D) between the populations of *An. deaneorum*, from Guajará-Mirim and Rio Branco, and *An. albitarsis*, from Baradero, was 0.317. Using criteria given by Avise (1974), this distance can be regarded as indicating that *deaneorum* and *albitarsis* are cryptic species. When only the type-localities are considered the genetic distance between the two species increases to the range 0.33-0.45. Similarly the D among the populations from Guajará-Mirim and Rio Branco was less than 0.108 equivalent to an intrapopulational variation.

RESUMO

Anopheles (Nyssorhynchus) deaneorum: **uma nova espécie no complexo** *albitarsis* **(Diptera: Culicidae)** – *Anopheles (Nyssorhynchus) deaneorum* sp. n. é descrito a partir de exemplares coletados em capturas comparativas no intradomicílio e no peridomicílio usando isca humana e animal e progênies de fêmeas ingurgitadas, em Guajará-Mirim, Rondônia e Rio Branco, Acre. A descrição detalhada do ovo, dos adultos fêmea e macho, inclusive cibário da fêmea, genitália, quetotaxia da pupa e da larva e seu perfil isoenzimático, mostram que esse mosquito pode ser distinguido do *Anopheles albitarsis* na fase adulta pelo aspecto geral mais claro, pela presença de tufos laterais de escamas escuras somente a partir do quarto ou quinto tergitos abdominais, enquanto em *albitarsis* começam no terceiro e, na fase larvária, pela ramificação das cerdas clipeais anteriores externas, que em *albitarsis* são aciculadas (como mostram as ilustrações), bem como pelo padrão isoenzimático.

Palavras-chave: *Anopheles (Nyssorhynchus) deaneorum* sp. n. – mosquito – Culicidae – Brasil – complexo *Anopheles albitarsis*

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