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THE NEOTYPE OF *ANOPHELES ALBITARSIS* (DIPTERA: CULICIDAE)

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Anopheles albitarsis *neotype is described from specimens collected in Baradero, Argentina, in a Shannon's trap, in horse and pig stables and on the progeny of engorged females. The description includes illustrations of adult female, male and female genitalias, scanning electron microscopy of the eggs and complete chaetotaxy of pupa and larva. The importance for electing a neotype is based on the realization that* An. albitarsis *is a complex of cryptic species. It is an attempt to provide type-locality specimens with which other members of the group can be compared.*

Key words: *Anopheles (Nyssorhynchus) albitarsis* – neotype – mosquito – Culicidae – Argentina

Anopheles (Nyssorhynchus) albitarsis is the most widely distributed anopheline in the neotropics. It was described from Baradero, Argentina, by Lynch-Arribálzaga in 1878 as having entirely white 3rd and 4th hind tarsi. The mosquito was considered to be slightly anthropophilic. It was not found in dwellings or highlands.

This specific name is given to mosquitoes variable in morphology, kariotypy and behavior and apparently in the capacity to transmit malaria in different areas, suggesting that *albitarsis* could be a complex of cryptic species. It has been regarded either as one of the major Brazilian malaria vectors (Kumm, 1932; Coutinho, 1942a, b; Schiavi, 1945; Rachou, 1958; Ferreira, 1964) or as of minor importance (Freitas, 1942; Deane et al., 1948).

The high polymorphism, implication in malaria epidemiology and the lack of a type-specimen are important factors for electing a neotype for the species. This necessity was recognized previously by Umana et al. (1959) but the redescription was presented in a Scientific Meeting and according to the Rules of Zoological Nomenclature it can not be considered a neotype designation. In that work they made the original description of the egg and a somewhat detailed description of the adult female, but not of the male or larva and pupa. Anyway the series described by them with the paratypes was lost.

In 1984 we initiated our studies on what we regarded as an *albitarsis* complex. Two years later we visited Baradero to collect specimens from the type-locality. On that occasion even though we had been informed that all types were lost we looked for Lynch-Arribálzaga collection at the "Museo de Ciencias Naturales de. La Plata" and in Buenos Aires at the "Instituto Malbrán" and in the Department of Entomology of the "Museo Bernardino Rivadávia". Only in the former was one specimen found. It was an *albitarsis* (no. 49014) from the Eduardo Del Ponte collection caught in Concépcion, Tucumán Province. The Umana's collection at the "Departamento de Entomologia Sanitaria de la Dirección General de Sanidad del Norte" in Tucumán was also lost.

In view of the lack of both type and neotype material and the fact that the original description by Lynch-Arribálzaga contains insufficient data by current standards, we decided to elect a new neotype for *albitarsis* based on our collection, in 1986, of specimens from Baradero, the type-locality. The neotypic series includes females, caught in a Shannon's trap using a calf as bait and in horse and pig stables and on the progeny of engorged females.

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

FEMALE – (Figs 1-8 and 10). *Head.* Vertex with darkish integument with narrow pale

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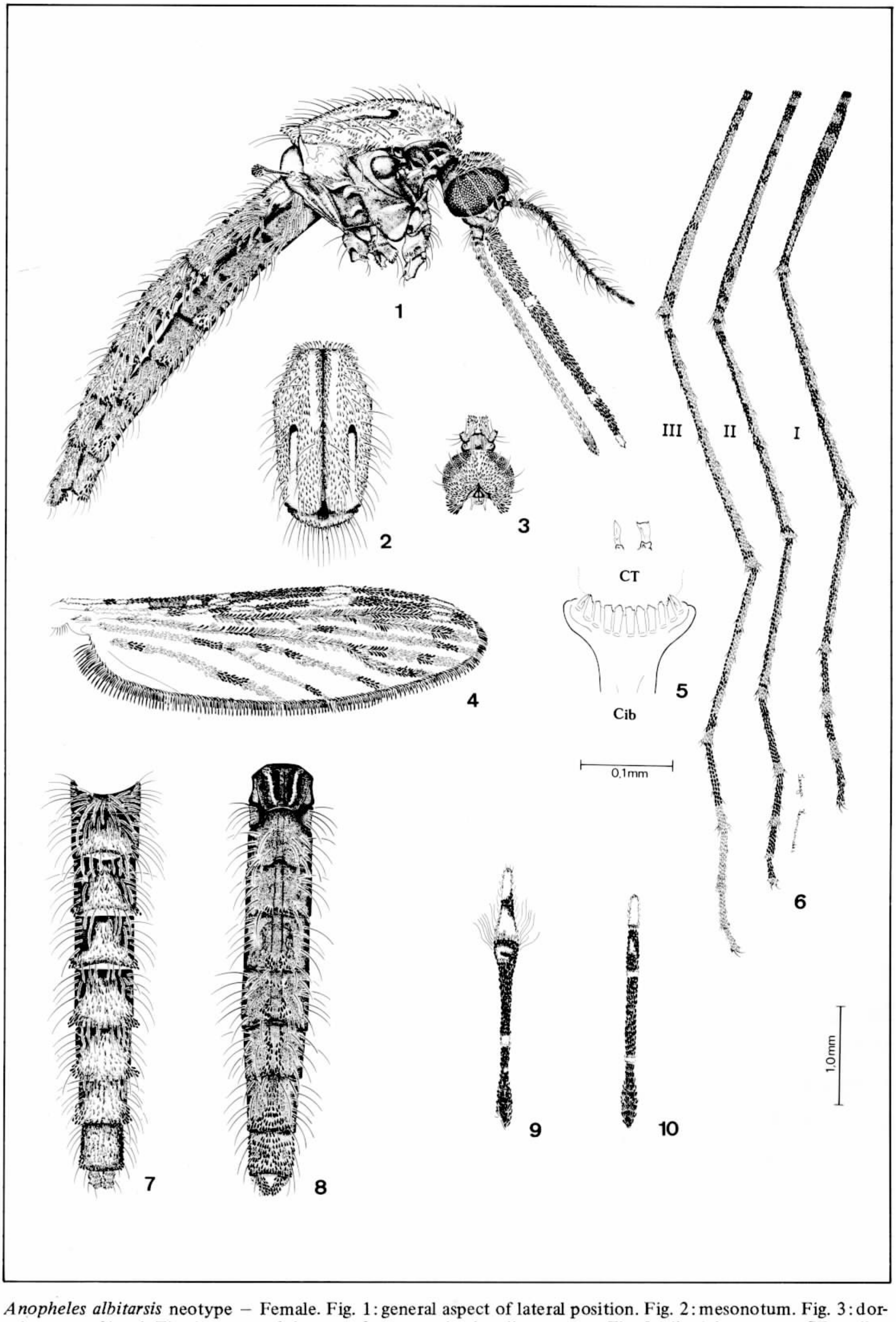


Anopheles albitarsis neotype – Female. Fig. 1: general aspect of lateral position. Fig. 2: mesonotum. Fig. 3: dorsal aspect of head. Fig. 4: aspect of the most frequent wing banding pattern. Fig. 5: cibarial armature; CT – cibarial teeth. Fig. 6: legs. Figs. 7 and 8: dorsal and ventral aspect of abdomen. Figs. 9 and 10: male and female palpi.

scales; side of eyes with falcate white scales; flat-ended spatulate scales numerous, pale yellowish; ocular and interocular setae lengthy; three long pairs of setae near frons in the interocular space; numerous darkish flat-ended spatulate setae in the postgena. Proboscis darkish with several falcate darkish scales; labellum clear with few small round-ended spatulate scales; basal bristles brown. Maxillary palpus as long as proboscis and coated with white and dark round-ended spatulate and falcate scales and a few setae. First segment entirely covered by dark scales; second segment with dark round-ended spatulate scales including a few scattered white scales with a white ring of scales at apex; third segment essentially the same as the second; fourth segment with dark falcate scales, white scales forming a spot in the middle; fifth segment 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 in 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, in the middle and lower margin of the meskatepisternon, in the lower margin of the mesomeron. The darkish areas are in the upper margin of mesepimeron, meskatepisternon and in the postspiracular and anterior areas of the postpronotum. Pleural setae brown; pleural scales small round-ended spatulate yellowish; upper mesepimeral scales normally grouped as six; generally four in the prealar region of the meskatepisternon, usually five in the upper meskatepisternal area in the darkish area of the integument as well as in the lower meskatepisternal area. Setae usually situated in the same area of the scales; upper proepisternal area with two or three strong and dark setae in the median region without associate scales; a few, usually two or three, in the prealar region of the meskatepisternon and two or three in the upper mesepimeral area; in the upper meskatepisternon two or three are also observed; generally one occasionally two in the lower meskatepisternon. Metepisternal integument brownish. Mesopostnotum nude brownish. *Wing.* Upper calipter with a complete fringe of long pale setae; remigium pale with spatulate white scales. White and black spatulate and falcate scales disposed in 5 different patterns, the most frequent as shown in Fig. 4; out of 30 specimens (14 females, 16 males) the costa wing dark spots were as follows: 3 had the basal, prehumeral, subbasal, median and preapical spots; 15 specimens had similar spots except for the basal and 5 specimens did not the basal and prehumeral. Melanotic types were represented by 2 specimens with the basal, prehumeral, fused subbasal and median and preapical spots and 5 similar specimens which did not have the basal. *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, femura, tibiae and tarsi covered with white and black spatulate and falcate scales and spines distributed as shown in Fig. 6. Variable percentage of blackness in the second hind tarsomere. 97 specimens were analysed for this character (65 females, 32 males). For males the average was 55.6% (s = 5.7) black, range 41.7 to 68.8%, and for females the average was 61.2% (s = 7.7), range 45.2 to 80.6%. Third, fourth and fifth hind tarsomeres entirely white. *Abdomen.* Integument dark covered by long and curved setae and round-ended spatulate and falcate scales. White falcate scales distributed in the median area of the tergites II to VIII, forming triangles until tergite IV where they increase covering almost all the dorsal surface; tergite I without scales. Lateral tufts formed of black spatulate scales from tergite III to VIII, some specimens present one or two scales each side of tergite II not being regarded as a true tuft. Sternal segment I with double row of white round-ended spatulate scales U or V shaped. Sternal scales whitish contrary to yellowish scales from tergum. Sternum 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* (Fig. 26). Tergum IX spiculose. Postgenital lobe short, roughly triangular shaped with two strong setae. Cercus elongate, spiculose with numerous flat-ended scales and long setae. Insular setae small, about 20, distributed in a circle. One spermathecal capsule with numerous pores.

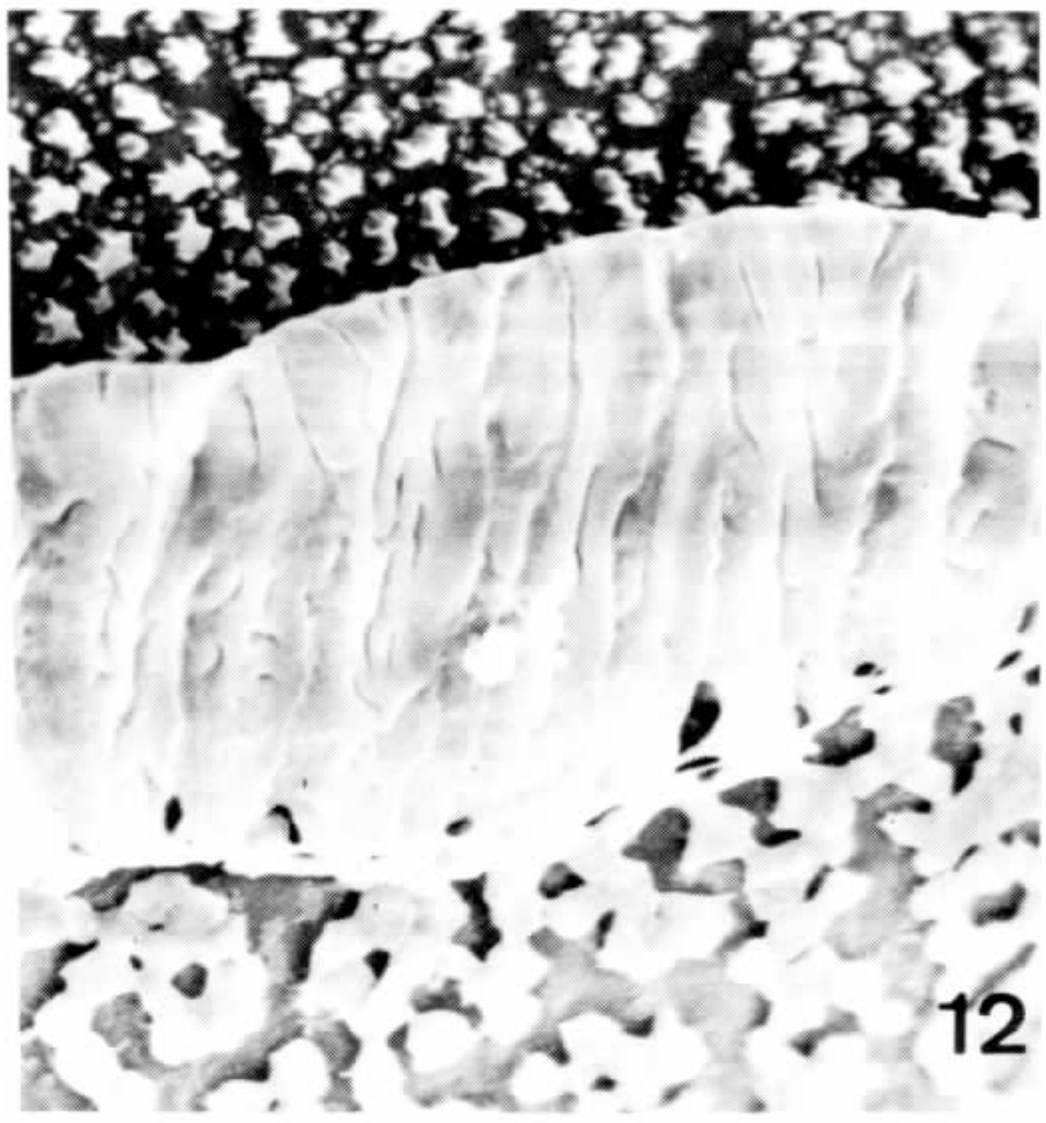
MALE – In general as described for female, except for the sexual differences. Antenna very plumose, about 0.65 of the proboscis length. Maxillary palpus round-ended club shaped (Fig. 9); entirely covered with white and black spatulate scales with a few long setae in the distal portion of the third segment; segment I with blackish scales; second segment with a few whitish scales scattered in the middle and laterally and a whitish ring of scales in the distal portion continuous to the proximal of the third; third segment with two rings in the proximal and distal portion respectively, entirely black between; fourth segment with a C or U-shaped spot of yellowish scales in the middle surrounded by blackish scales, a stripe of white scales in the distal portion; fifth segment with a initial white stripe, then black up to the middle; apex entirely white. *Genitalia* (Fig. 25). *Segment IX* ring shaped, open in the ventral face; cuticle covered by numerous small setae. *Gonocoxite* elongate with numerous spatulate scales and strong and long setae in the tergal surface extending to the lateral of the sternal surface; cuticle with lateral sternal surface with numerous spatulate scales and strong and long setae in the middle, minute setae in the inner surface. Spiculose cuticle except below insertion of the accessory setae where there is a nude triangular area. Parabasal lobe bearing a rodlike seta 1/3 size of the two accessory setae which are rodlike and apically bent; internal seta long and curved; below accessory setae there is the claspete insertion with the membranous leaflike scale. *Gonostylus* slender, curved with a row of minute setae on the inner surface; a simple larger seta is inserted before the gonostylar claw. Phalossome: basal lobule membranous; aedeagus cylindrical without setae or scales; strongly chitinized areas in lateral surfaces; lanceolate at apex.

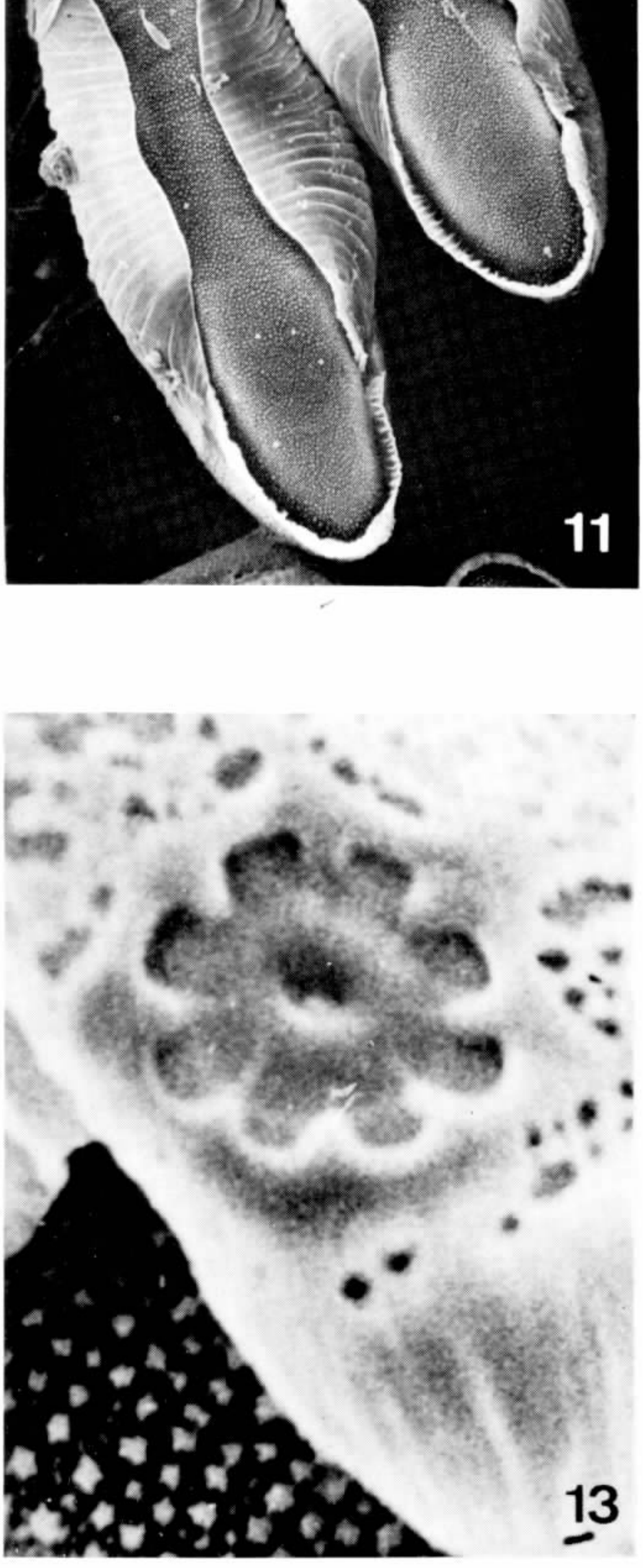
EGG (Figs 11-18) – Under the scanning electron microscopy the exochorion is formed by globular tubercles interconnected by filaments upon a base formed by small globular particles distributed homogeneously on a dark integument. Floats formed by about 20 ridges and continued to the anterior and posterior extremities by a ribbed and narrow frill. Endochorion formed by both small and large star-shaped tubercles.

LARVA (Figs 19-22) – Chaetotaxy and general aspect as figured and in Table I. Head pale except for the pigmented area symmetrically situated in lateralia; anterior tentorial arm complete; hypostomal suture incomplete not reaching the colar; colar strongly pigmented. Clypeal index 1.00-1.40. Dorsomentum with three lateral teeth on each side of a medial developed tooth. Ventromentum with 2 lateral teeth on each side of two medial developed teeth. Antenna lengthened, more densely spiny on inner surface. Thorax roughly square shaped. Abdominal tergal plates squared, strongly pigmented from segment I to VIII. Palmate seta with the apex flat, as if cut, from segment II to VII. 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 cuticle; saddle complete, brownish with a single seta; grid with 8 pairs of pectinate setae. Anal papillae long and slender, longer than saddle.

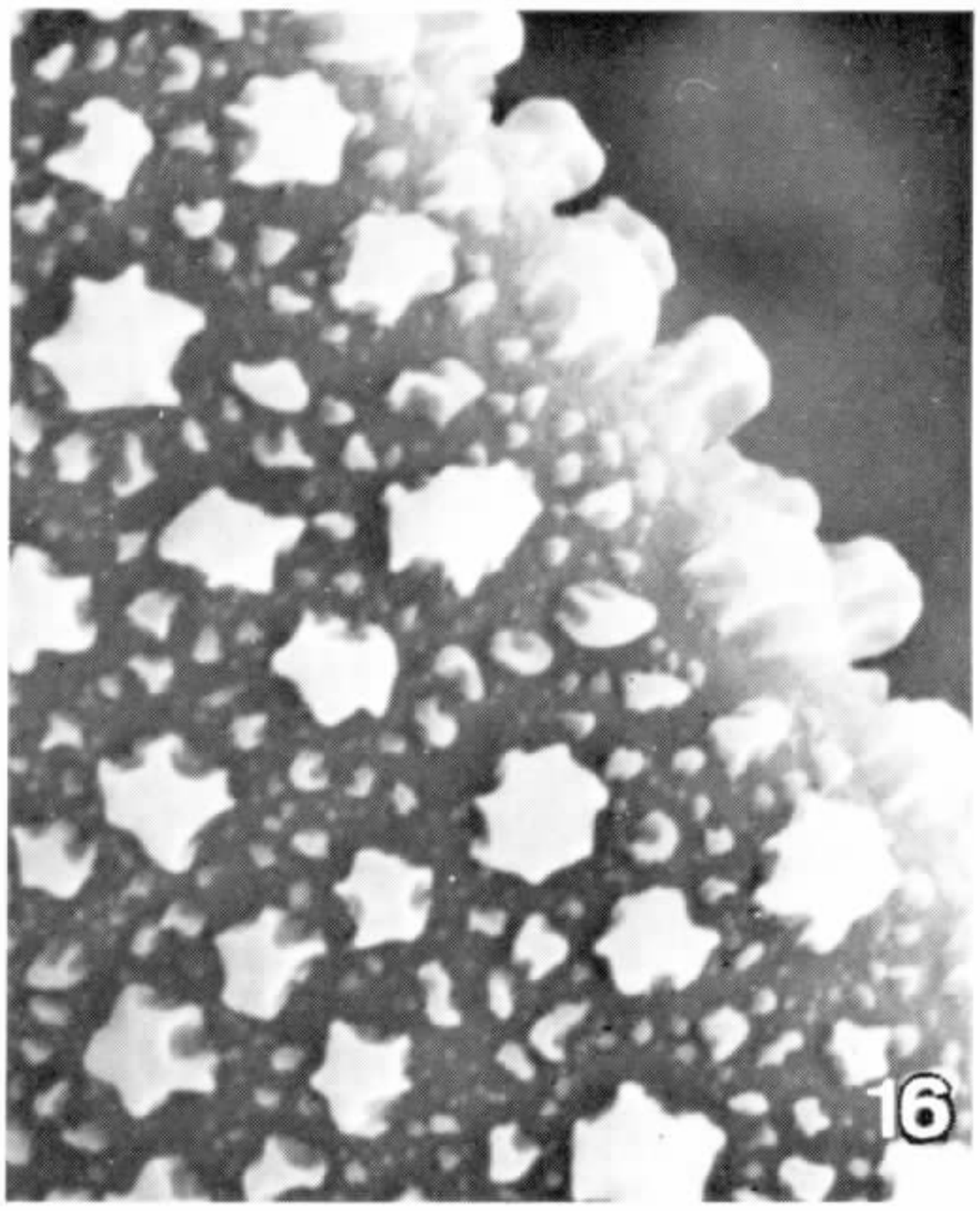
PUPA (Figs 23-24) – General outline and chaetotaxy as figured. Table II lists the range and modal number of branches for setae. Trumpet heavily dark pigmented, spiculose, pinna angusticorn shaped. Metathorax with a round spot each side of dorsal surface. Paddle nearly twice as long as segment VIII; slightly serrated from the apex until near the middle of the lateral margin; ovate, rounded at apex, pale; midrib and butress not well developed, slightly darker than the general tone of paddle. Genital lobe as pigmented as the midrib.

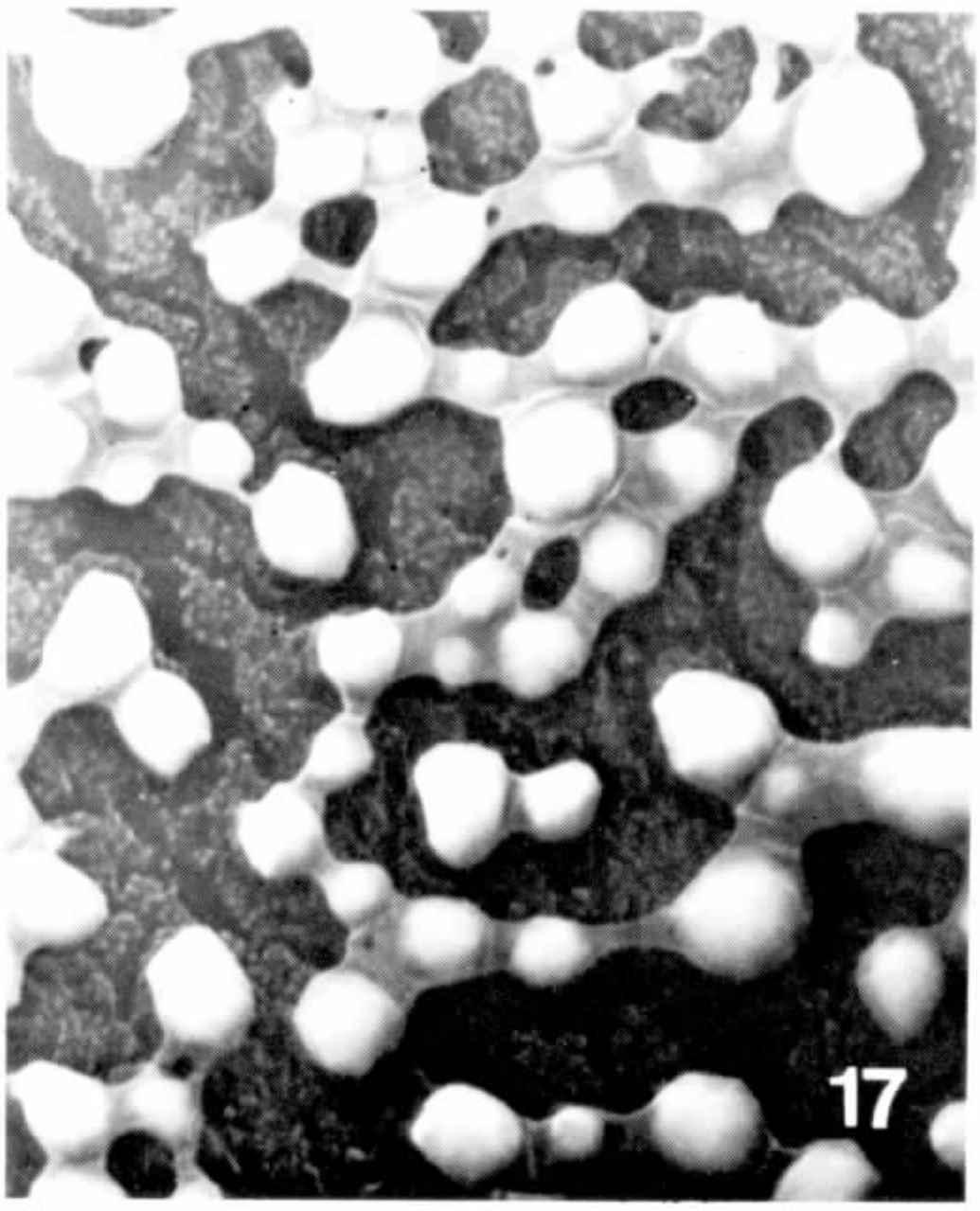
Type data – Neotype and additional material examined deposited in the Costa Lima Entomological Collection of Oswaldo Cruz Institute. Neotype 3C9*12 (no. 6153), Baradero, female, Penitentiary Service – Penal Unit 11, Baradero (33°50'S, 59°30'W), Buenos Aires Province, Argentina, sea level; progeny from a female caught on horse, 9 Feb. 1986. Ad-



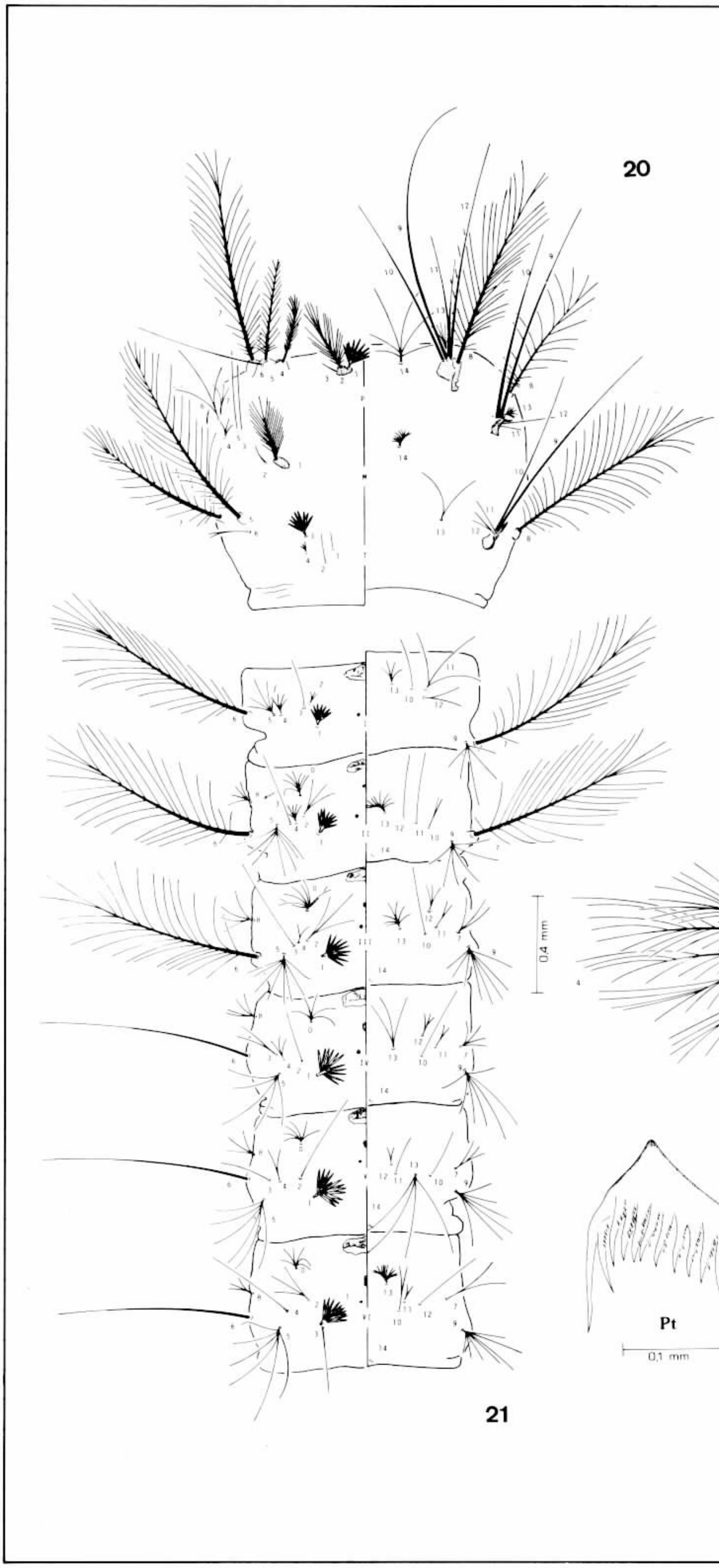


Anopheles albitarsis neotype – Egg. Fig. 11: scanning electron microscopy of the egg in ventral aspect (200 X). Fig. 12: detail showing endochorion (above), frill (middle) and exochorion (below) (1000 X). Fig. 13: micropile (1500 X). Fig. 14: inner side of the frill showing the ribbed aspect (2000 X). (Phot. by Wanderley de Souza & Fernando Costa e Silva Filho, Instituto de Biofísica Carlos Chagas Filho, UFRJ).





Anopheles albitarsis neotype – Egg. Fig. 15: endochorion (4500 X). Fig. 16: lateral view of endochorion (4500 X). Fig. 17: exochorion (4500 X). Fig. 18: exochorion (15000 X). (Phot. by Wanderley de Souza & Fernando Costa e Silva Filho, Instituto de Biofísica Carlos Chagas Filho, UFRJ).



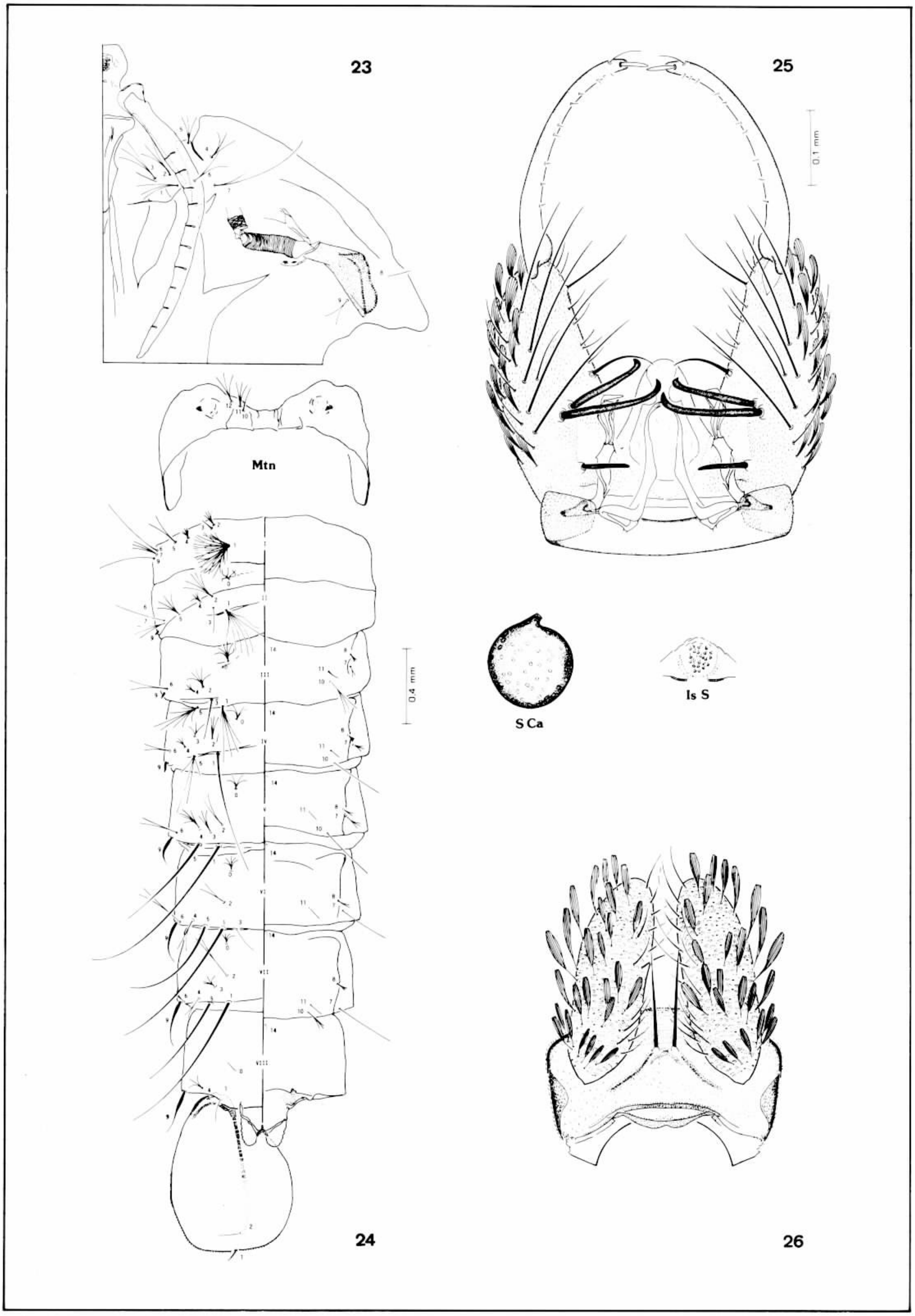
Anopheles albitarsis neotype – Larva. Fig. 19: head. Fig. 20: abdomen (segments I-VI); palmate seta 1-IV. Fig. 21: thorax; Vm – ventromentum; Dm – dorsomentum. Fig. 22: abdominal segments VII-X; Pt – pecten, SAp – spiracular apparatus.

TABLE I

Complete chaetotaxy of larva of *Anopheles albitarsis* from the type-locality, Baradero, Argentina

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

Range of number of branches for setae with mode in parenthesis.



Anopheles albitarsis neotype – Pupa and genitalias. Fig. 23: cephalothorax. Fig. 24: Mtn – metanotum and abdominal segments I-VIII. Fig. 25: male genitalia. Fig. 26: female genitalia; SCa – spermathecal capsule; IsS – insular setae.

TABLE II

Complete chaetotaxy of pupa of *Anopheles albitarsis* from the type-locality, Baradero, Argentina

Seta	Cephalothorax	Metathorax	Abdomen								
			I	II	III	IV	V	VI	VII	VIII	
0	–	–	–	4-6(5)	4-6(5, 6)	2-6(4)	3-5(4)	2-5(5)	3-5(4)	1-3(1)	
1	2-3(3)	–	Dendritic	6-13(7)	5-8(6)	1	1	1	1	1	
1 paddle											1-2(1)
2	2-3(3)	–	3-6(4)	3-7(4, 5)	3-5(4, 5)	2-3(3)	1-3(2)	1-2(2)	1-2(1, 2)	–	
2 paddle											1-2(1)
3	2-3(3)	–	1-2(1)	1	1-2(1)	3-5(3)	2-4(2, 3)	1-4(1)	2-5(3, 4)	–	
4	2-4(3)	–	3-6(4, 5)	3-6(4)	2-4(3)	2-5(3)	3-5(3, 5)	1-3(2)	1-3(2)	3	
5	3-5(3)	–	1-2(2)	3-6(4)	6-8(7)	1-5(3, 4)	1-2(1)	1	1	–	
6	2-3(2)	–	1-2(1)	1-2(1)	2-3(2)	2-3(2)	1-3(2)	2	1-2(1, 2)	–	
7	1-3(2)	–	1-5(3)	3-5(3)	2-5(2)	2-4(3)	2-4(3)	1-3(1)	1-3(1)	–	
8	1	–	–	–	2-5(3)	2-4(3)	2-4(2)	1-3(2)	3-5(3)	–	
9	2-3(2)	–	1	1	1	1	1	1	1	1	
10	–	1	–	–	1-3(3)	1	1	–	1-3(2, 3)	–	
11	–	2-5(3)	–	–	1-2(1)	1	1	1	1-3(1)	–	
12	–	2-4(3)	–	–	–	–	–	–	–	–	
14	–	–	–	–	1	1	1	1	1	1	

Range of number of branches for setae with mode in parenthesis.

ditional material: 3 females and 4 males from the same progeny of the neotype (no. 6154-6160); other 4 males and 1 female from progenies 2C2 and 1P1 (no. 6161-6165); larval, pupal skins, male and female genitalia and cibarial armature mounted on slides are also deposited (slides no. 5578-5591). In the Entomological Collection of the Department of Epidemiology of the Faculty of Public Health, São Paulo University were deposited 4 specimens from the progeny of the neotype (3C9) and 7 specimens from other progenies.

Distribution – Although we have been studying populations from 10 localities we are not yet able to determine the boundaries of the groups found. A population morphologically similar to that of Baradero was found in São Borja, Rio Grande do Sul State, Brazil. Probable distribution of *albitarsis sensu strictu* would be at the South of the Tropic of Capricorn, possibly extending northwestwards, following River Paraguai.

Material examined – For the determination of % black in the 2nd hind tarsomere, 32 males, 65 females; for the patterns in the costa wing spots 14 males, 16 females; for genitalia, 9 males, 4 females; for complete chaetotaxy, 30 larvae, 30 pupal skins; 5 cibarial armatures.

Taxonomic discussion – Because of the white distal portion of the hind legs *Anopheles albitarsis* was in the past generally misidentified either as *An. argyritarsis* Robineau-Desvoidy, 1827 or as *An. braziliensis* Chagas, 1907 (Howard et al., 1917; Peryassú, 1921; Root, 1923; Christophers, 1924), in spite of Hunter's (1900) indexation in his Catalog of South American Diptera and Brethés (1916) confirmation as a good species. After 1925, following the male genitalia description (Petrochi, 1925), the species was better defined and Root (1926) in his work on Brazilian anophelines places *albitarsis* correctly. At that time Brazilian anophelines were denominated under subgenus *Cellia,* since Theobald (1902) mixed typical *Nyssorhynchus* with typical *Cellia* species. Thus, 6 different species were recognized in the Brazilian territory: *Cellia albimana, Ce. tarsimaculata, Ce. oswaldoi, Ce. argyritarsis, Ce. allopha* and *Ce. braziliensis,* although Christophers (1915) had shown that the American *Cellia* disagreed with the *Cellia pharoensis* type-specimen from the Old World. Root (1926) claimed the *Nyssorhynchus* subgenus to American species, the type-species being *Anopheles albimanus.* Root studied the specimens and concluded that only 3 species were valid: *Anopheles tarsimaculatus (Ce. albimana* and *Ce. oswaldoi* apparently represented darker and paler *tarsimaculatus* variations*), An. argyritarsis* (in its majority included *Ce. allopha*) and *An. albitarsis* (would include *Ce. argyritarsis* not coincident with Robineau-Desvoidy's type-specimens). In the same paper Root described

An. darlingi and *An. strodei* and performed comparative measures of the % black of the second hind tarsomere and of the length of the subcostal pale spot of the wing in specimens from Brazil and Argentina, finding great variation. He observed a clear correlation between the distance from the equator (latitude increasing) and the increase in the % black in the second hind tarsomere and wings.

Davis (1928), conducting a statistical study on Argentinean specimens, considered *albitarsis* the most variable *Nyssorhynchus* species. The subcostal pale wing spot (Harbach & Knight's, 1980 nomenclature, only subcostal to Davis based on Root's, 1926 nomenclature) could be present (74.1%) or absent (25.9%). In the latter the absence characterizes the fusion of the median and preapical dark spots. The basal and prehumeral pale spots (Davis' B1 and B2) were frequently fused (57%), which implies the absence of the basal dark. The existence of presector pale (M1) that would split the subbasal dark in humeral dark, humeral pale and presector dark was observed in only 1 out of 158 specimens; it was from Resistência, Chaco. The median tarsi rings and those from the first hind tarsus could be absent, vestigial or extensive; the blackness of the 2nd hind tarsomere varied from 40 to 95%. In the same year Costa Lima (1928) reported a regional variation for the black extension in the 2nd hind tarsomere: in Rio de Janeiro State more than half of the segment was black; in Minas Gerais State it was 66%; in Mato Grosso State, between 70-78% and in São Paulo State from 85 to 89%. *An. albitarsis* specimens from São Paulo were studied by Galvão & Barretto (1938) who separated them in 3 groups: a group with forms related to those characterized by Root (1926); another with atypical forms related to *albitarsis* variety *braziliensis* and the third with also atypical forms which were closer to *argyritarsis*. Nevertheless they kept *albitarsis* as a unified group because of the 2 rows of white scales in the first esternite (a character seen only in 1930 by Shannon & Davis); the absence of the posterolateral tuft of scales in the 2 first abdominal segments and undistinguishable eggs, larvae and pupae. In all groups the prehumeral dark (B2) wing spot was very variable.

Because of the great number of observed varieties, the distinct epidemiological importance and the loss of type-material, Umana et al. (1953) decided to study *An. albitarsis* eggs and females from the type-locality, Baradero. In this population they observed the smooth homogeneously punctuated aspect of the egg exochorion. They verified a % black extension of 70% in the 2nd hind leg tarsomere and a general dark appearance of the wing costa given by the small dimensions of the basal, prehumeral and humeral pale spots (B1, B2 and B3 for the authors) and by the absence of the presector and sector pale (M1 and M2) and of the subcostal pale (Sc). The absence of the presector pale spot implies the fusion of the humeral with presector dark areas, i. e., the existence of the subbasal dark. The absence of the sector pale joins the presector dark with the median dark and the absence of the subcostal pale, that joins the median dark and the preapical dark give a very dark aspect to the costa. The posterolateral tuft of scales were present from the 3rd to the 7th abdominal tergites. This material no longer exists.

The high morphological and behavioural variability presented by species in different places led to the description of many varieties. The first was *An. albitarsis braziliensis* by Root (1926), who while studying specimens of *An. braziliensis* (Chagas, 1907) obtained in the type-locality, Lassance, Minas Gerais State, did not find reliable differences to give *braziliensis* a species *status*. However, Deane et al. (1948) reported that Root based his observations on heterogeneous material and in fact had not examined the true *braziliensis* larvae. This would led Root to mention *braziliensis* as an *albitarsis* variety and Galvão & Lane (1937a) to describe *An. pessoal* (= *An. brasiliensis* in Lane, 1953) as a new species. Still in 1937, Galvão & Lane (1937b) described the *albitarsis limai* variety based on the finding of a morphologically distinct egg from those figured by Root in 1926. The variety was invalidated when it was verified that in Root's paper the egg described in plate VIII as *albitarsis* was in fact *darlingi* and no *albitarsis* eggs were shown (Causey et al., 1942). Correa & Ramos in 1942 gave to a variety the name of *imperfectus*, that one year later was considered as a melanotic *albitarsis* specimen possessing a black ring in the 3rd hind tarsomere but the progeny of which was formed by normal typical specimens (Correa, 1943 *apud* Galvão, 1944). Galvão & Damasceno (1942) described *An. marajoara* as a closely related species to *albitarsis* from Marajó island material. It differed from *albitarsis* in the absence of white rings in the 3rd anterior

tarsomere, in all median tarsomeres and in the 1st hind tarsomere; in the pilosity of the dorsal claspette lobe and lateral extremities of the basal lobe and in the long and simple posterior clypeal hair of larvae (4C). They stressed however that all these characters are very variable in *albitarsis*. Years later Galvão (1944) would consider it as an anomalous finding, the species failing in the *albitarsis* synonymy.

In 1944 Galvão & Damasceno based on distinct morphological and behavioral aspects divided the species in two subspecies: a strongly endophilic subspecies, with 36 to 50% of black in the 2nd hind tarsomere, a mosaic in the egg exochorion and related to malaria transmission, which was named *Anopheles albitarsis domesticus* and an exophilic subspecies named *Anopheles albitarsis albitarsis* with 77 to 84% of black in the 2nd hind tarsomere, a granulose exochorion and not related to malaria transmission. However there soon appeared conflicting reports. Deane et al. (1948) identified in the Northeast and Amazon Regions of Brazil, 3 different types of *albitarsis:* (i) endophilic, with 40-60% of black in the 2nd hind tarsus, which would be related to Galvão & Damasceno's *domesticus;* (ii) common in Guajará-Mirim, Rondônia State, with larvae having branched anterior external clypeal hairs (3C), adults bred from these larvae with 40-60% of black in the 2nd hind tarsomere similar to *domesticus*, but with the postero-lateral tergal tuft of black scales was seen only in the last two or three segments; (iii) the most abundant anopheline, in the most arid zone of the Northeast, with 25 to 47% of black in the 2nd hind tarsomere, thus less than in *domesticus*, but being strongly exophilic, rarely invading dwellings.

Rachou (1958) confirming Galvão & Damasceno's division added that where Galvão & Damasceno's *albitarsis* has endophilic habits, it presented the black portion of the 2nd hind tarsomere never exceeding 70% (55% average) while in regions where it was exophilic, this portion always measured more than 70%.

To Faran & Linthicum (1981), *An. albitarsis* would correspond to two species: *An. allopha* and *An. albitarsis*, differing by some morphological characters, distinct geographical distribution and vectorial capacity: only *allopha* would be able to transmit malaria. However to Lourenço-de-Oliveira & Deane (1984), none of the known anopheline species coincide with Lutz & Peryassú's description of *allopha,* which was based on heterogeneous material, and hence should be considered *nomem nudum.* Later Linthicum (1988) changed *allopha* for *marajoara* accepting the former as *nomem dubium.*

Albitarsis populations from 18 Brazilian States were morphologically studied by Rios et al. (1984). They verified the high intra-populational variability of taxonomically important characters, such as the pilosity of the anal lobe of the male genitalia (characters that would differentiate *domesticus* from *marajoara*) and the percentage of black in the 2nd hind tarsomere (supposedly distinguishing *domesticus* from *albitarsis*). As Root (1926) and Davis (1928), they correlated the variation of blackness to the latitude, and found that it was impossible to separate the two species on the basis of Galvão & Damasceno's (1944) criteria.

Recent morphological, kariotypical and isoenzymic studies have shown *albitarsis* as a complex of cryptic species (Kreutzer et al., 1976; Steiner et al., 1982; Rosa-Freitas, 1988). A distinct variant, having larvae with branched clypeal hairs and adults with postero-lateral tufts beginning in the 5th or 6th abdominal segment, seen in Guajará-Mirim by Deane et al. (1948) was also found in Rio Branco, Acre State (Rosa-Freitas et al., 1987).

The realization that *Anopheles albitarsis* is a complex of cryptic species has emphasized the importance of a type-specimen with which to compare other members of the group.

This present paper describing a neotype for *An. albitarsis* is an attempt to provide a foundation from which the analysis of the species can be made.

RESUMO

O neótipo de *Anopheles albitarsis* (Diptera: Culicidae) — O neótipo de *Anopheles albitarsis* é descrito a partir de espécimens coletados em armadilha tipo Shannon, em estábulos de cavalos e porcos e progênies de fêmeas ingurgitadas, em Baradero, Argentina, localidade-tipo da espécie. A descrição inclui ilustrações da fêmea adulta, genitálias masculina e feminina, ovos em microscopia eletrônica de varredura e da quetotaxia completa das larvas de 4º estádio e pupas. A eleição de um neótipo para *albitarsis* baseia-se

em dados recentes que apontam a espécie como um complexo de espécies crípticas, o que evidencia a importância de uma descrição detalhada de espécimens da localidade-tipo com o qual outros membros do grupo possam ser comparados.

Palavras-chave: *Anopheles (Nyssorhynchus) albitarsis* – neótipo – mosquito – Culicidae – Argentina

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