

## THE OPILIONID FAUNA OF AN ISOLATED VOLCANO IN SOUTHEASTERN VERACRUZ

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The volcano San Martín is located about 12 kilometers north of the town of San Andrés Tuxtla, Veracruz. It is 5050 feet high as determined by an aneroid barometer. This is one of a group of five major cones which are the eastern terminus of a transverse zone of volcanic activity. These volcanic cones are biologically isolated as they are more or less surrounded by savannah and low coastal forest. Although two volcanic eruptions within historic times (1662 and 1793) have covered the north slope and base with lava and the south and west slopes with ash, the endemic fauna was able to survive. This was demonstrated first by Wetmore (1943) who found a somewhat distinctive bird fauna and decided that much of the fauna was subtropical and represented a remnant from the cooler Pleistocene. He thought the fauna was able to maintain itself at this comparatively low elevation inasmuch as the local temperature is modified by cloud banks. Some of the birds present were similar to those found at higher elevations in Central American volcanoes. These observations were later confirmed for amphibians by Firschein (1950).

The upper slopes of San Martín are covered with a luxuriant tropical rain forest while most of the lower slopes have been cleared for cultivation. The summit of the volcano has a low, shrubby forest composed of many species of plants found at higher elevations in Chiapas and in other mountain areas of Veracruz. The summit is much cooler and wetter than the precipitous slopes. In this low forest there is an extensive growth of moss that covers much of the ground and hangs on the trees and fallen logs.

Two collections of opilionids were made. The first was at an elevation of 3500 feet at the base of the principal cone; locally this site is known as La Cocina. The second was made at the summit where opilionids were found in the moss that covered much of the area.

Three species of the family Phalangodidae were discovered. *Cynortina acanthotibialis* Goodnight and Goodnight is widespread and variable in form, and this record represents a considerable extension of its known range. The female of *Stygnomma bispinata* Goodnight and Goodnight was discovered at the summit; originally it was found at approximately the same altitude on the volcano Tacaná in southern Chiapas. The discovery of this species tends to confirm Wetmore's theory that the fauna of this volcano represents Pleistocene remnants. *Philora tuxtlae*, new species, is distinctive and is related to the genus *Paramitraceras*. Members of the latter genus are common in the mountainous areas of Chiapas and Guatemala.

SUBORDER LANIATORES THORELL; PHALANGODIDAE SIMON;  
PHALANGODINAE ROEWER

*Cynortina acanthotibialis*, Goodnight and Goodnight (Fig. 4).

*Cynortina acanthotibialis* Goodnight and Goodnight, 1953, Amer. Mus. Novitates, No. 1610, pp. 15-17, Figs. 2-8.

Male: Total length of body, 2.8 mm. Cephalothorax, 0.8 mm. Width of body at widest portion, 2.1 mm.

Cephalothorax smooth except for a few scattered small granulations. Eye tubercle low, rounded, with a pair of tubercles above, one over each eye. Eye tubercle slightly removed from the anterior margin. Abdomen with five distinct areas, the boundaries of which are parallel to one another. Dorsal areas quite smooth, with only a few scattered tubercles. A transverse row of small hair-tipped tubercles across the median portions of the third, fourth, and fifth areas; these are larger on the fifth. Lateral margin of the scute with a row of very low granulations. Each free tergite with a transverse row of hair-tipped spines. Anal operculum with nine or ten spines, the median one of this group longer and more conspicuous. Each free sternite with a transverse row of small granulations. Coxae with scattered hairs and granulations, maxillary lobe of second coxa without a ventral projection. The spiracle more or less hidden by a distal projection from the fourth coxa.

Entire surface of legs clothed throughout with hairs, all segments except the tarsi tuberculate; these tubercles are somewhat larger on the prolateral surface of the third and fourth femora. Third and fourth femora curved. Tarsal segments: 3-6-5-6. Distitarsus of first tarsus with two segments, of second with three.

Length of Legs (mm)

	I	II	III	IV
Trochanter.....	0.2	0.3	0.3	0.4
Femur.....	0.8	1.0	0.8	1.2
Patella.....	0.3	0.5	0.4	0.5
Tibia.....	0.4	0.9	0.7	1.1
Metatarsus.....	0.9	1.0	0.9	1.2
Tarsus.....	0.5	1.0	0.6	0.8
Total.....	3.1	4.7	3.7	5.2

Palpus: Trochanter, 0.2 mm. long; femur, 0.5; patella, 0.3; tibia, 0.4; tarsus, 0.3. Total length, 1.7 mm. Palpus armed retrolaterally as in Figure 4. Prolaterally the femur and patella each has an apical median spine, the tibia has three spines, and the tarsus two. Chelicera clothed throughout with hairs, otherwise smooth. Proximal segment with a slight dorsal elevation. Entire animal brownish yellow with the posterior portion of the abdomen and the legs darker brown except for the trochanters.

Female: Total length of body, 2.5 mm. Cephalothorax, 0.8 mm. Width of body at widest portion, 2 mm. Similar in appearance to male, but lacking the slightly enlarged chelicerae and the leg spination.

Record: two females and one male from the summit of volcano San Martín, July 14, 1953. This record represents another population of this highly variable form.

*Philora*, n. gen.

Phalangodid with a common eye tubercle, which is located on the anterior margin of the cephalothorax. The eye tubercle in the form of a

pointed cone. Abdominal scute with five areas, first without a median line. On each side of the first area there is a small lateral enlargement. Tarsi of third and fourth legs without scopulae and with untoothed claws. Femur of first leg not enlarged. Tarsus of first leg with but two segments; distitarsus of first tarsus with one segment. Second distitarsus also with a single segment. Metatarsi of legs not divided into astraguli and calcanei. Maxillary lobe of second coxa without a ventral projection.

Genotype.—*Philora tuxtlae*, n. sp.

This new genus is closely related to *Paramitraceras*, but differs mainly in the number of segments in the first tarsus and in the number of segments in the distitarsi of both the first and second tarsi.

*Philora tuxtlae*, n. sp. (Figs. 1 and 2)

Male holotype: Total length of body, 2.4 mm. Cephalothorax, 0.7 mm. Width of body at widest portion, 1.7 mm.

Cephalothorax smooth, eye tubercle in the form of a forward pointing cone with the eyes at the base. Eye tubercle situated on the anterior margin of the cephalothorax. Dorsum with five distinct areas, the boundaries of which are parallel. The lateral margin of the abdominal scute with a distinct bulge in the region of the first area. Dorsal areas finely granulate, with some few larger tubercles in the median portion of the fourth and fifth areas. The posterior portion of the lateral margin with a row of tubercles. Each free tergite with some spinose tubercles in the median portion. These are larger on the third free tergite. Anal operculum and free sternites with scattered hairs and granulations. Coxae clothed throughout with hairs and with scattered granulations. Spiracle hidden. Maxillary lobe of second coxa without a ventral spine.

Legs clothed throughout with hairs, small tuberculations present on all segments except the metatarsi and tarsi. Tuberculations larger on the third and fourth femora. The third and fourth femora are short and curved. Fourth femur bearing a row of tubercles on the ventral surface, terminating in a short apical spine. Tarsal segments: 2-2-4-4. Distitarsus of first tarsus with one segment; second, also with one.

Length of Legs (mm)

	I	II	III	IV
Trochanter.....	0.2	0.2	0.2	0.3
Femur.....	0.9	1.2	0.9	1.1
Patella.....	0.3	0.4	0.4	0.5
Tibia.....	0.6	0.8	0.7	0.9
Metatarsus.....	0.7	0.8	0.8	1.2
Tarsus.....	0.4	1.0	0.5	0.5
Total.....	3.1	4.4	3.5	4.5

Palpus: Trochanter, 0.2 mm. long; femur, 0.6; patella, 0.4; tibia, 0.5; and tarsus, 0.4. Total length, 2.1 mm. Palpus armed retrolaterally as in Figure 1; a very small median apical tubercle on the femur prolaterally; patella unarmed; tibia and tarsus armed as on retrolateral surface. Chelicera clothed throughout with hairs, smooth except for a few tuberculations on the distal dorsal margin of the proximal segment. Proximal

segment with a very slight elevation. Entire animal dark reddish brown, somewhat mottled with darker brown.

Type locality: male holotype and male paratypes from an altitude of 3500 feet on volcano, San Martín, July 14, 1953.

Both holotype and the paratypes are deposited in the arachnid collection of the American Museum of Natural History, New York.

*Stygnomma bispinata*, Goodnight and Goodnight (Fig. 5).

*Stygnomma bispinata* Goodnight and Goodnight, 1953, American Museum Novitates, No. 1610, pp. 31-32, Fig. 18.

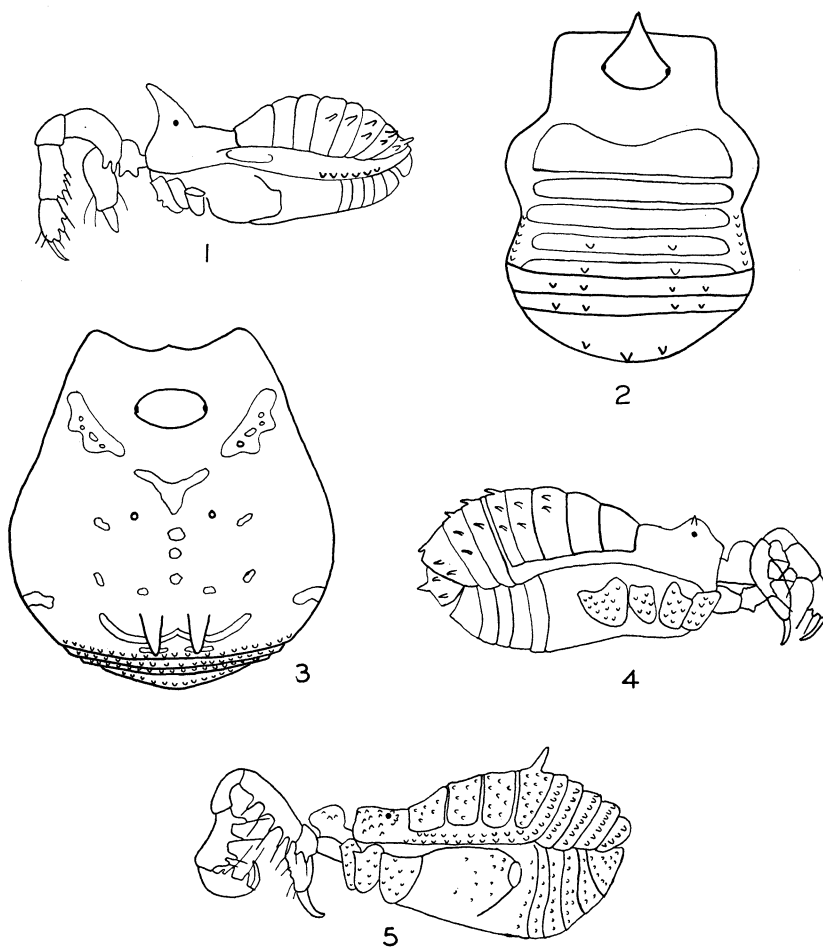


FIG. 1. *Philora tuxtlae*, lateral view of male holotype.  
 FIG. 2. *Philora tuxtlae*, dorsal view of male holotype.  
 FIG. 3. *Cynorta gregaria*, dorsal view of male holotype.  
 FIG. 4. *Cynortina acanthotibialis*, lateral view of male.  
 FIG. 5. *Stygnomma bispinata*, lateral view of female.

Female: Total length of body, 2.5 mm. Cephalothorax, 0.7 mm. Width of body at widest portion, 1.7 mm.

Cephalothorax granulate; with a few larger tuberculations on the anterior lateral margin. Eyes widely separated, without a common eye tubercle. Cephalothorax without a median spine. Abdomen with five distinct areas, the boundaries of which are parallel. All areas with numerous granulations. Fourth area with a median pair of large spines. Fifth area with a transverse row of small tubercles, each free tergite with a transverse row of large tubercles. Anal operculum granulate, each free tergite with a transverse row of granulations. Coxae with scattered tubercles. First coxa with a transverse row of larger tubercles. Spiracles visible, but partly concealed by the fourth coxa. Maxillary lobe of second coxa without a ventral projection.

Legs clothed throughout with hairs, all segments, but the metatarsi and tarsi with granulations. These granulations are larger on the third and fourth femora; third and fourth femora straight. Tarsal segments: 6-13-7-8. Distitarsus of first tarsus with two segments, second with three.

Length of Legs (mm)

	I	II	III	IV
Trochanter.....	0.3	0.4	0.4	0.4
Femur.....	1.8	2.5	1.9	3.0
Patella.....	0.4	0.5	0.5	0.6
Tibia.....	1.1	2.3	1.5	2.0
Metatarsus.....	1.5	3.0	2.1	3.1
Tarsus.....	1.1	2.4	1.2	1.7
Total.....	6.2	11.1	7.6	10.8

Palpus: Trochanter, 0.3 mm. long; femur, 0.9; patella, 0.6; tibia, 0.7; and tarsus, 0.6. Total length, 3.1 mm. Palpus armed retro-laterally as in Figure 5. Prolaterally the femur and patella each has two spine-tipped tubercles; tibia and tarsus armed as in retrolateral view. Tarsal claw long and curved. Chelicera clothed throughout with hairs, proximal segment with a few dorsal tubercles, with a slight elevation. Entire animal dark reddish brown, lighter ventrally; in some specimens, the palpus is lighter.

Record: two females from summit (5050 feet) of volcano San Martín, July 14, 1953.

This is the first female of this species. It was previously known only from a single male collected at volcano Tacaná (5000 feet). These females differ from the male only in the possession of smaller chelicerae and fewer spines on the legs and dorsum; they also lack the enlargement of the distal half of the third metatarsus typically found in males of this genus.

#### COSMETIDAE SIMON

##### *Cynorta gregaria*, n. sp. (Fig. 3).

Male holotype: Total length of body, 4.2 mm. Cephalothorax, 1.7 mm. Width of body at widest portion, 3.7 mm.

Cephalothorax smooth, eye tubercle low. Abdominal scute smooth except for a median pair of low tubercles on the first area. A medium pair of large straight spines on the third area and a row of small tubercles across the posterior portion of the fifth area. Each free tergite with a transverse row of small tubercles. Anal operculum smooth, free sternites smooth. Coxae with scattered hairs, a ventral transverse row of spines across the first coxa. Fourth coxa with a dorsal apical spine.

Legs clothed throughout with hairs. A few small tubercles on the first, second, and third femora. Fourth femur somewhat clavate in shape and with heavier tubercles. Distal portion with the largest diameter and with the heaviest tuberculations. Fourth patella and tibia tuberculate. Tarsal segments: 6-12-8-9. Distitarsi of both first and second tarsi with three segments. Basitarsus of first tarsus slightly enlarged.

Length of Legs (mm)

	I	II	III	IV
Trochanter.....	0.5	0.6	0.6	0.7
Femur.....	2.1	4.5	3.2	4.5
Patella.....	0.9	1.1	0.9	1.2
Tibia.....	1.5	3.2	1.9	2.7
Metatarsus.....	2.5	4.4	3.3	4.9
Tarsus.....	1.8	3.3	2.1	2.5
Total.....	9.3	17.1	12.0	16.5

Palpus: Trochanter, 0.8 mm. long; femur, 1.2; patella, 0.8; tibia, 1.2; and tarsus, 0.7. Total length, 4.7 mm. Palpus characteristically flattened, clothed throughout with hairs, with a ventral row of teeth on the femur. Chelicera enlarged, clothed throughout with hairs, a few lateral tubercles present on the proximal segment. Entire body dark reddish brown, the white pattern as indicated in Figure 3. Appendages somewhat lighter and mottled.

Female: Total length of body, 4.2 mm. Cephalothorax, 1.8 mm. Width of body at widest portion, 3.7 mm. Similar to male in appearance, but lacking the enlarged basitarsus of the first tarsus, the enlarged chelicerae, and the heavy tubercles of the fourth femora.

Type locality: Male holotype and female paratype from 3500 feet on volcano San Martín, July 14, 1953. Both the male holotype and female paratype are deposited in the arachnid collection of the American Museum of Natural History.

*C. gregaria* is related to *C. apicalis* (Cambridge), but differs in the dorsal color pattern and in the spination of the fourth leg of the male.

*Vonones pelaezi* (Goodnight and Goodnight)

*Ornotus pelaezi* Goodnight and Goodnight, 1942, American Museum Novitates, No. 1211, p. 6, Fig. 19 (New synonymy).

Records: one female from 5050 feet and one female from 3500 feet on volcano San Martín, July 14, 1953.

## LITERATURE CITED

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WATER-MITES OF THE GENUS *ATURUS*  
(FAMILY AXONOPSIDAE)

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Although *Aturus* is one of the commoner inhabitants of streams in this country, it is, nevertheless, very rare in collections and inadequately treated in the literature. This is due, in part, to the difficulty in collecting and preparing animals less than half a millimeter long. The known species of *Aturus* from North America and six new species are discussed.

The family Axonopsidae, to which *Aturus* is assigned, contains twenty-six genera. A key to the Holarctic genera is given by Viets (1936). *Aturus* has been divided into three subgenera. One of these, *Crinalurus*, has not been generally recognized, and the other two, *Aturus sensu strictu* and *Subaturus*, are defined on the presence or absence of a spine on the second palp segment. This is a good key character but it is not adequate as a subgeneric definition. It is not possible to provide extended subgeneric definitions applicable to the world fauna at this time and the species considered below have been arranged in broadly defined species groups. These are more useful for the Nearctic *Aturus* at present than the narrowly defined subgenera.

Three authors have published on North American *Aturus*. Crowell's (1953) report of *Aturus intermedius* Protz, a European species, has been rejected (Mitchell, in press). Koenike (1895) recorded *A. scaber* from North America. This was renamed *A. mirabilis* by Piersig (1897) and has not been reported since. The problems concerning its assignment are considered below.

Habeeb (1953a, 1953b) named nine species of *Aturus* each based on a few specimens collected in New Brunswick. Lack of illustration and vague terminology makes it impossible to use these descriptions or to assign the species to appropriate groups. Through the courtesy of Mr. Habeeb, types have been examined and five of the species are redescribed on the basis of more extensive material in the writer's collection. The remaining four species are known only from two or three mounted type specimens. An adequate redescription of these forms is in order.

Species of *Aturus* must be defined and related on the basis of males. Females may be separated by small differences in genital acetabula,