

SMITHSONIAN MISCELLANEOUS COLLECTIONS

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A NEW SPECIES OF SAND BUG, BLEPHARIPODA
DOELLOI, FROM ARGENTINA

(WITH ONE PLATE)

BY

WALDO L. SCHMITT

Curator, Division of Marine Invertebrates
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CITY OF WASHINGTON
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A NEW SPECIES OF SAND BUG, BLEPHARIPODA DOELLOI, FROM ARGENTINA

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The occurrence of *Blepharipoda* on the east coast of South America, first reported by Carlos Berg (1900, p. 225), has long been of interest (Porter, 1911, p. 17; 1916, p. 279). Heretofore, specimens from both the Atlantic and Pacific coasts have always been identified with Randall's species, *B. occidentalis* (1839, p. 131, pl. 6), the type of the genus, which ranges along the west coast of North America from San Francisco, Calif., to San Quentin and [Santa] Rosalia Bays, Lower California. San Diego, Calif., is its type locality.

In the course of determining three Blepharipodas on loan from the Argentine National Museum¹ through the kindness of the Director, Dr. Martin Doello Jurado, it was discovered that they represented an undescribed species. This species I take great pleasure in naming in honor of Dr. Doello.

As a result of this discovery, I naturally wanted to see Philippi's *B. spinimana* (1857, p. 129, pl. 8) from the coast of Chile, which at least as far back as the turn of the century (Ortmann, 1896, p. 222) had been relegated to the status of a synonym of *B. occidentalis*. Our absolute lack of comparative material was most generously remedied by Dr. Carlos E. Porter, from whom we received a dried female of good size collected at Antofagasta by Prof. José Herrera. This specimen made it possible to validate Philippi's species. I am also indebted to Dr. Porter for certain rare items of his own writings dealing with *Blepharipoda*. In two of these (1915, p. 78; 1916, p. 280) very complete bibliographic references are given, along with some very helpful personally entered annotations, as well as a copy of one of his very recent publications in which the occurrence of the Antofagasta *Blepharipoda* received from Dr. Porter was first reported upon (1940, p. 311).

¹ Museo Argentino de Ciencias Naturales, Buenos Aires.

All Chilean records for *Blepharipoda* should now be referred to *B. spinimana* (Philippi), and, as far as we know, those from the Argentine to *B. doelloi* described below. Besides these two and the genotype, only one other real *Blepharipoda* seems to have appeared in literature, *B. spinosa*² (*Albunhippa spinosa* Milne Edwards and Lucas, 1841, p. 477, pl. 28, figs. 1-13). This species, if valid, remains yet to be rediscovered. As Miers (1878, p. 335) has already remarked, well over half a century ago, "The locality whence the specimen described by Milne Edwards and Lucas was obtained is not stated; and there is nothing in their description to distinguish it from either of the foregoing species. The hands are represented in the figure as devoid of spines, but are described as spinose. Dana [1850, p. 406] gives no particulars which would serve to characterize the specimens collected by the U. S. Exploring Expedition [at San Lorenzo, Peru]."

Two other "sand bugs," believed at the time of their description to have been Blepharipodas, are *B. japonica* Duruflé (1889, p. 93, one fig.) and *B. fauriana* Bouvier (1898a, p. 566; 1898b, p. 339, figs. 1-5). According to Balss (1914, p. 92) the second of these is a synonym of the first, and this in turn is more properly a representative of the genus *Lophomastix* defined 10 years earlier by Benedict (1904, p. 621).

BLEPHARIPODA DOELLOI, new species

Blepharipoda occidentalis BERG, Com. Mus. Nac. Buenos Aires, vol. 1, No. 7, p. 225, 1900 (specimen from Mar del Plata).—PORTER, Bull. Mus. Hist. Nat. (Paris), vol. 17, No. 1, p. 17, 1911 (specimen from vicinity of Bahía Blanca); Rev. Chilena Hist. Nat., vol. 19, p. 78, fig., 1915 (specimens from Argentina); Physis (Buenos Aires), vol. 2, p. 279, fig., 1916 (specimens from Argentina).

Description.³—Because of the limited material at hand, nothing can be stated definitely regarding the maximum or even average size of our new species as compared with its congeners. The three specimens of *B. doelloi* are very much smaller than all the *B. occidentalis* I have seen except one small specimen lacking locality data which is about the same size as the average of our specimens of *B. doelloi*. What appears to be the largest specimen of *B. occidentalis* in the collections of the United States National Museum measures all of

² Misspelled *speciosa* in the key given by Bouvier (1898b, p. 342) in his "Observations nouvelles sur les Blepharopoda Randall (*Albunhippa* Edw.)."

³ This description is largely a comparison of the new species with the well-known *B. occidentalis* Randall and the here reestablished *B. spinimana* of Philippi. It is believed that the distinguishing characters of the new species will be better presented in this manner.

57 mm. in median length of carapace, rostral projection included. The single available dried specimen of *B. spinimana* measures 27.5 mm. on the median line of the carapace, exclusive of the distal extremity of the rostral projection which is lacking.

As compared with *B. occidentalis*, the anterior portion of the carapace of *B. doelloi* before the cervical groove is very little roughened; the scabrosities⁴ of the central area are confined largely to a narrow interval either side of the median ridge or carina; in *B. spinimana* a very similar condition obtains. In *B. occidentalis*, on the other hand, except for a small, more or less circular smooth area either side of the median line just behind the level of the dorsal spine, the anterior portion of the carapace is very generally and conspicuously roughened or scabrous. This character alone will at once distinguish *B. occidentalis* from the other species here discussed.

The rostral projection of *B. doelloi* is distinctly shorter than the lateral projections of the front which, though subacute, are elongate triangular; their inner, orbital margins are straight and very nearly longitudinal; the distance from the level of the posterior margins of the orbital sinuses to the level of the anterior extremities of the lateral projections of the front is considerably greater than half the distance from the tip of one lateral projection to the other, or, stated another way, very appreciably greater than the distance, at the same level, from the tip of either lateral projection to the median line of rostral projection extended. In *B. occidentalis* the rostral projection normally (and in almost every instance) reaches the level of the anterior extremities of the lateral projections, and often a little beyond; the lateral projections from their more acute, more spiniform tips backward are more broadly triangular than in *B. doelloi* and so have the inner margin oblique to the median line and not subparallel as in *B. doelloi*; measured as in *B. doelloi*, the lateral projections of the front are usually much less in length than half the distance between their tips (fall short of the distance from the tip of either lateral projection to the median line of rostral projection). Similar measurements cannot be satisfactorily made for our one specimen of *B. spinimana*, as the distal extremities of all three frontal projections are wanting; yet, if Philippi's figure noted above can be depended upon, the rostral projection extends scarcely more than half as far forward as the lateral projections of the front. As compared above, the orbital

⁴ Strictly speaking, this apparent roughening of the surface of the carapace where it occurs in the several species of *Blepharipoda* consists of little short, transverse, or transversely arched impressions, most of which have their posterior margins pectinate and often hairy.

sinuses of *B. doelloi* are much narrower and deeper than the wider, shallower, and less triangular ones of *B. occidentalis*. Owing to the straight, longitudinal inner margin of the lateral projections of the front, the orbital sinuses of *B. doelloi* have an asymmetrical, sharply angled posterior margin, the apex of the angle lying close to the posterior end of the straight inner margin of each lateral projection; the posterior orbital margin of *B. occidentalis* is more or less broadly concave, at best only obtusely and, in any case, more or less symmetrically angled; in *B. spinimana* the posterior orbital margin is more sharply angled, as in *B. doelloi*, but, on the other hand, symmetrically so, the apex of the angle lying about midway between the major axis of either lateral and the median rostral projection.

The length of the long, slender first anterolateral spine of *B. spinimana* either side, measured (as a chord) from the level of the posterior margin (or apex) of the sinus between it and the side of the carapace, is much greater than half (three-fourths or more) of the distance between the apices of the lateral projections of the front. In *B. occidentalis*, the anterolateral spines are stouter and less than half as long as the distance between the apices of the lateral projections of the front. In *B. spinimana*, because the tips of the anterolateral spines are broken off, this character cannot be directly compared with the other two species.

In the genus *Blepharipoda* there is a fairly well marked groove running transversely inward from just before the antepenultimate spine of the lateral margin; behind this groove in turn is a similar but more profound one arising from just before the posteriormost of the lateral spines, and running obliquely inward and forward at roughly a 45° angle; this second oblique groove intersects, or if extended would intersect, the first-mentioned transverse groove. The hinder margin of these grooves, like that of the transverse frontal groove before the median carapacial spine and the posterior margins of the impressions on the surface of the carapace, is, in the known species, more or less pectinate and hairy.

From the point or locus where the two grooves intersect, or would intersect if sufficiently extended, what may be regarded as the continuation of the transverse groove takes on a different general direction in each of the three species of *Blepharipoda* here discussed.

In *B. doelloi* this apparent or actual continuation of the transverse groove turns forward at about a 45° angle and, in effect forms a continuation of the oblique groove. This character is another that definitely distinguishes our new species from both *B. occidentalis* and *B. spinimana*. In *B. occidentalis* the inner portion of the transverse

groove beyond the point where the oblique groove would intersect it is practically a "straight" continuation of the transverse groove with, if anything, a slight downward or backward trend; while in *B. spinimana* the inner portion of the transverse groove is a little arched or curved (forwardly convex) so that it appears to be on the inwardly curved end of the oblique groove.

In general, the chelipeds of the three species of *Blepharipoda* compared are very similar and similarly armed, yet a close inspection of their spinous armature reveals certain significant and rather constant details regarding the spines, their placement, and number. Throughout, the spines in *B. spinimana* are longer, stronger and relatively more conspicuously prominent, as its specific name would indicate. The dactyl of the chela in this species is no more than a strong, flattened spine with straight, not curved, margins, converging to form a very acute, slender (stilettolike) tip, its outer or upper margin is armed with two prominent, long, slender, and fairly straight spines; the anterior of the two spines is about two-thirds the length of the dorsal margin of the dactyl distal to its base, at first glance the spine in length appears almost subequal to the distal portion of the dactyl; the second, more proximal, of the two spines is very little less strong than the distal one; behind it there is a low, conical, subacute and not very conspicuous tubercle, a little better developed and more of a little cone on the right hand than on the photographed left. The prehensile margin of the fixed finger, or pollex, is armed with five spines, of which the distalmost is very strong and large; to all appearances it overshadows in size the distal spinelike portion of the pollex lying beyond it, although it actually is no longer and a little more slender (more circular in cross section) and not so compressed; the penultimate of the five spines is very little shorter or very little more slender than the ultimate one; but the next three are very much smaller and diminish rapidly in size, the most proximal one being very little more than a tiny pointed denticle or small spinule, well-nigh lost to sight in the thick fringe of hair with which the margin of the pollex is furnished. The upper margin of the carpus behind its conspicuously spinous anterior dorsal angle is armed with one larger spine about as large as the largest on the prehensile margin of the dactyl, followed by a very small spine; between the two spines there may be, as in the left but not the right hand, two tiny spinous, pricklike denticles.

In *B. doelloi* the upper margin of the dactyl of the chela is likewise armed with two slender spines, but these are forwardly curved and relatively much less strong and prominent than the corresponding spines in *B. spinimana*; the dactyl is gently curved or bowed, and

slightly hooked toward the tip; the anterior of its two (in each of the three specimens at hand) dorsal spines is only about one-third the length of the dorsal margin of the dactyl extending in front of its base. The more proximal of the two spines is between three-fourths and four-fifths the length of the distal one; behind it there is no tubercle or denticle comparable to the one present in *B. spinimana*. The prehensile margin of the fixed finger or pollex is armed with three sharp, more or less subequal conical spines (antepenultimate usually a little smaller than ultimate), followed by a small, inconspicuous denticlelike fourth spine and two little equidistant projections, or scarcely to be noticed sinuosities, of the margin; perhaps they are suggestive indications of a normally undeveloped fifth and sixth denticle. The distalmost of the series of spines on the fixed finger is about one-fourth the length of the prehensile margin of the pollex in advance of the base of the spine. The upper margin of the carpus is armed at about its anterior third with a single spine about the size of, or slightly larger than, the spine arming the anterodorsal angle of the carpus; it is also about the size of the more distal and larger of the two spines arming the dorsal margin of the dactyl; behind this spine the upper margin of the carpus is smooth and unarmed; on its inner surface the carpus is armed with a strong double or bifid (to the base) spine in the case of the left cheliped only; in the right carpus there is but a single spine in this position, as in *B. spinimana* and *B. occidentalis*.

In *B. occidentalis* the dactyl is appreciably curved or bowed from base to tip; its upper margin is armed with three or four spines, rarely only two, and occasionally with five, the two distalmost spines are of good size, but, as in *B. doelloi*, relatively much less prominent than in *B. spinimana*, the most anterior, or distal spine of the series is about two-fifths or less of the length of the dorsal margin of the dactyl extending in front of its base; the penultimate spine is usually nearly as large as the ultimate one, and sometimes, as in the figured left hand of this species, even larger. The prehensile margin of the pollex seems usually to be armed with five spines of which the distalmost is much the larger and about the size of the ultimate one of the series arming the dorsal margin of the dactyl, the succeeding spines diminished rapidly and regularly in size to the most proximal one which is small but stout, and more of a conical tubercle than a spine. Behind its spinous anterodorsal angle the upper margin of the carpus is armed with three or four spines (in the series before me there is just one specimen with two spines on one carpus only) situated in about the penultimate fourth of the dorsal margin of the joint.

The dorsal margins of the carpi of the first and second pair of legs following the cheliped (second and third pair of peraeopods) are denticulated or spined; the spines are much more numerous, more closely set, sharper, and more spiniform and take in more of the margin in *B. occidentalis* than in *B. doelloi*; in *B. spinimana* those on the carpi of the second peraeopods, at least, appear stouter and more conical-tuberculiform than spiniform, as compared with the other two species. There are appreciable differences in the dactylar joints of each of the peraeopods following the chelipeds, most readily observed in the case of the dactyls of the second pair of peraeopods. In the first place, a straight edge laid across the more or less straight basal, proximal portion of the anterior margin barely intersects the tip of the fingerlike distal portion of the dactyl in *B. occidentalis*, as is the case also in *B. spinimana*; in *B. doelloi*, however, such a straight edge laid along the anterior margin of the proximal basal portion of the dactyl cuts off a third to a half of the fingerlike distal process of the dactyl.

In the second place, the more or less straight basal, proximal portion of the dactyl has the mid portion of its margin shallowly excavate both in *B. occidentalis* and *spinimana*, while in *B. doelloi*, where the margin seems relatively shorter, it is in general outline gently or slightly convex, though in its mid portion, at least, it may be rather straight.

In the third place, the sinus between the distal fingerlike process and the basal portion of the dactyl is differently shaped in each of the Blepharipodas: in *B. occidentalis* it is relatively narrow, and noticeably obliquely undercuts the distal end of the basal portion; in *B. spinimana* the proximal margin of this sinus would form more or less of a right angle to a straight edge laid across the anterior (or dorsal) margin of the basal portion of the dactyl, or even very slightly or almost imperceptibly obliquely undercuts the basal portion; while, on the other hand, in *B. doelloi* the proximal margin of the sinus forms an angle very slightly more than a right angle.

There are also comparable differences in the shape, marginal outline, and relative proportions of the dactylar joints of the last two pairs of peraeopods, particularly in those of the fourth pair. Using the more or less straight anterior or upper margin of the basal portion of the dactyl just distal to the articulation of this joint with the carpus as a base line, the perpendicular height or depth of the dactyl of *B. occidentalis*, taken at the distal end of this base line, is subequal to, or very little greater than, the distance that the tip of the dactyl extends beyond the perpendicular on which the height of the dactyl is measured; while in *B. spinimana* and *B. doelloi* it is noticeably

greater, in the former about one-fifth of the perpendicular height of the dactyl greater, and in the latter a third greater (cf. fig. 8).

Examining a *Blepharipoda* from below, one will observe at least some armature in the shape of a spine or conical tubercle on the anterior face of the coxopodites of one or more of the peraeopods following the chelipeds. In the male of our new species the coxa of the second peraeopod is furnished with two such spines each on the second and third, and one on the fourth, while the holotype female is correspondingly armed with two, one, and one spines. The male of *B. occidentalis* has two spines on the coxa of the second peraeopod, one on the third, and only a rather small conical tubercle on the fourth; the female has a single spine on the coxa of the second peraeopod and none on the third or fourth; in these two peraeopods a very small, or at most a tiny beadlike indication may be noted on close inspection in some specimens in the position where a spine might be expected and does occur in the other species. Of *B. spinimana* we have but the one female, the coxae of second peraeopods of which are spined as in the female of *B. occidentalis*, except that no beadlike indications appear to occur on the third and fourth peraeopods.

The telson of neither the male nor female of *B. doelloi* seems to show anything of the posterior median emargination so plainly evident in *B. occidentalis* and *B. spinimana*; instead, the margin of the telson of *B. doelloi* is continuous and appears to go evenly around the posterior end from one side of the telson to the other. I am not unmindful of the fact that Randall, in his original figure of *B. occidentalis* (1839, pl. 6), and apparently Philippi also, for his "*Abrote* [*Blepharipoda*] *spinimana*" (1857, pl. 8), depicted the telson of their respective species as posteriorly pointed or acuminate, a condition reminiscent of some of the Albuneas, and more remotely of the Hippas in general. I have personally yet to encounter a similarly pointed telson in any *Blepharipoda*. Of *B. occidentalis*, in particular, I have examined a considerable number of individuals of both sexes.

*Material examined and figured.*⁵—

Blepharipoda doelloi:

Female holotype, 22 mm.

Mar del Plata, Argentina, February 1924, coll. "Atair," Leloir and Franceschi; one of three specimens collected, M.A.C.N. No. 14303.

Female paratype, 19 mm.

Quequen, coll. G. Haedo, M.A.C.N. No. 13946.

Male allotype, 15 mm.

Quequen, coll. G. Haedo (hijo), M.A.C.N. No. 14189.

⁵ The measurements given represent the median length of the carapace, inclusive of the rostral projection.

Blepharipoda occidentalis:

Female, 36.5 mm.

Male, 29.5 mm.

Both from Long Beach, Calif., coll. H. N. Lowe [1910], U.S.N.M.
No. 79389.

Of this species a considerable series ranging from San Francisco, Calif.,
to Santa Rosalia Bay, Lower California, Mexico, has also been examined

Blepharipoda spinimana:

Female neotype, 27.5 mm.

Province of Antofagasta, Chile, coll. Dr. José Herrera, U.S.N.M.
No. 79390.

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DESCRIPTION OF PLATE

PLATE I

FIGS. 1-3. *Blepharipoda doelloi* new species.

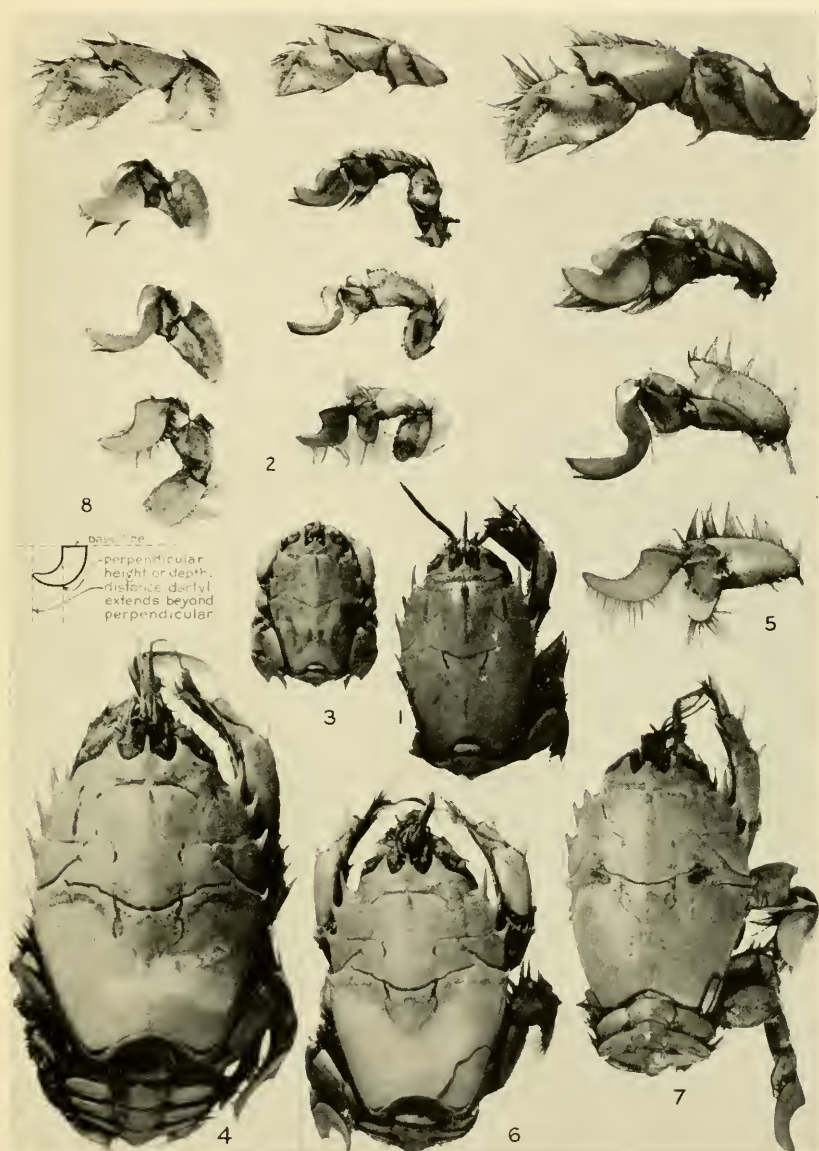
1. Dorsal view of female holotype from Mar del Plata, Argentina; median length of carapace, inclusive of rostral projection, 22 mm.
2. First four pereopods of left side of same.
3. Dorsal view male allotype from Quenquen, Argentina; median length of carapace, inclusive of rostral projection, 15 mm.

FIGS. 4-6. *Blepharipoda occidentalis* Randall.

4. Dorsal view of female from Long Beach, Calif.; median length of carapace, inclusive of rostral projection, 36.5 mm.
5. First four pereopods of left side of same.
6. Dorsal view of male from Long Beach, Calif.; median length of carapace, inclusive of rostral projection, 29.5 mm.

FIGS. 7, 8. *Blepharipoda spinimana* (Philippi).

7. Dorsal view of female from Province of Antofagasta, Chile; median length of carapace, inclusive of broken rostral projection, 27.5 mm.
8. First four pereopods of left side of same, with diagram indicating method of taking measurements of dactyl of fourth pereopod discussed on p. 7.



SPECIES OF BLEPHARIPODA

(For explanation, see p. 10.)