ORTHOPTEROLOGICAL NOTES II

THE PHYLLOPHORINAE (ORTHOPTERA, TETTIGONIIDAE) IN THE RIJKSMUSEUM VAN NATUURLIJKE HISTORIE, LEIDEN, AND IN THE ZOÖLOGISCH MUSEUM, AMSTERDAM

by

Dr. C. DE JONG

Besides the rather scanty material collected before 1900 the Phyllophorinae of the Leiden and the Amsterdam Museums consist of many of Karny's type specimens, and a number of specimens collected in New Guinea, especially by Van Kampen and by Versteeg.

Though various authors (Kirby, 1899; Griffini, 1908) published papers of fundamental value concerning this subfamily of the Tettigoniidae, the general survey given by Caudell (1912) was little critical, in different genera even species are placed here of which the synonymy had already been established before (cf. Karny, 1924, pp. 19, 20). A modern revision of the subfamily was given by Karny (1924).

Though Karny based his paper on a rather large number of specimens and a great deal of literature, it appears that there exist more species. The Leiden as well as the Amsterdam collections contain some specimens which could not be identified with the help of Karny's keys, and which did not fit in with the descriptions of the species already known. For that reason I feel justified to describe these as new species.

All specimens dealt with below, Karny's type specimens included, were carefully compared with the descriptions to avoid misinterpretations of Karny's view. In a few cases, however, I cannot agree with Karny's views concerning certain details in the keys as well as in the descriptions and I have given some additional notes when dealing with the genera or species under consideration.

I abstained from giving a new key as that of Karny will do for the present when my remarks are taken into account.

Sasima Bolívar

Sasima spinosa (Brunner von Wattenwyl)

Leiden Museum:

? Ternate: 1 ♀, the 2nd label runs: "Rosenberg, Andai, N. G. acq. 1870." Possibly the first label is wrong.

New Guinea: 1 ♀, Dorey, leg. D. J. Hoedt; 1 ♂ Sepik River, 18.IX 1910, in the jungle, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11; 1 ♂, S. New Guinea; 1 ♀ larva, Humboldt Bay, II 1911, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11.

Locality unknown: 1 ♂ larva.

Amsterdam Museum:

Misool: 1 ♂, 1870.

Locality unknown: 1 ♀, ex coll. A. Mos.

Sasima angulipennis Karny

Leiden Museum:

New Guinea: 1 ♂, Sekroe, MacCluer Bay, leg. K. Schädler, (acq. 1897); 1 ♂, Zoutbron, VI 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11.

Sasima truncata (Brunner von Wattenwyl)

Amsterdam Museum:

New Guinea: 1 ♀ South New Guinea, 1912/13, leg. G. M. Versteeg.

Sasima bifurcata Karny

Leiden Museum:

Celebes: 1 ♂, Menado (holotype) (ex Mus. Buitenzorg).

New Guinea: 1 ♀ larva, X 1911, leg. K. Gjellerup, Nederl. Nieuw Guinea Exp. 1910/1911.

Sasima aequalis Karny

Leiden Museum:

New Guinea: 1 ♂ (holotype) (ex Mus. Buitenzorg).

Sasima versteegi nov. spec. (figs. 1 and 2)

Amsterdam Museum:

New Guinea: 1 ♂ South New Guinea, Kloofbivak, 12 X 1912, leg. G. M. Versteeg (holotype).

General characters of *Sasima*. The colour of the holotype is yellowish brown, discoloured in alcohol. In all probability the colour of the living animal was light green.

The disc of the pronotum (fig. 1) is elongated lozenge-shaped, notched at the anterior part. The short anterior margin thus formed is almost straight. At the lateral angles two small thorns are found, which are curved upwards. Besides these thorns the prozona of the pronotum bears two more

thorns, slightly stronger than the anterior ones, one on each lateral margin, pointing obliquely upwards and slightly forwards. The mesozona on each side on its lateral margin bears two thorns on a common base, the anterior of which is largest and points obliquely upwards. The posterior thorn points in a more lateral direction. The armament of the metazona is as follows: before the large humeral thorn it bears (from the mesozona up to that thorn) on each side one small thorn pointing more or less upwards, one somewhat stronger thorn directed laterally with a smaller one on its base posteriorly, one small thorn pointing laterally and a small one at the base of the humeral thorn. Then follows the complex humeral thorn itself.

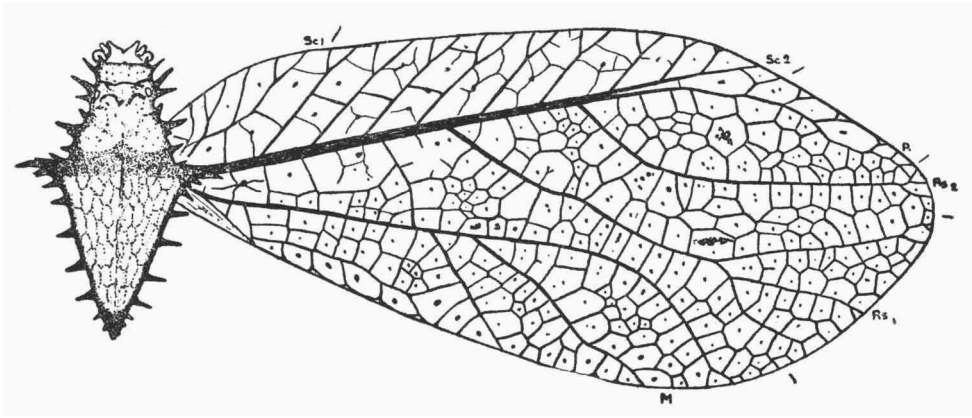

Fig. 1. *Sasima versteegi* nov. spec., ♂ holotype, head, pronotum and right tegmen. × 1½.

Dorsally and posteriorly it bears three smaller thorns which originate from the same base. On the almost straight lateral carinae of the caudal part of the metazona 5 to 6 rather strong spines are found at comparatively large intervals. These thorns are all pointing in a lateral direction. The surface of the disc of the pronotum is deeply punctulated on the prozona, on the mesozona except for two semilunar and two oval spots at the base of the lateral spines, and, except at the anterior margin of the metazona, the remaining part of the dorsal surface of the pronotum is punctulated less deeply and finer. The surface of the disc behind the humeral thorns shows a distinct reticular structure with longitudinal cells. On the anterior part of the metazona a similar reticular structure is found but it is more superficial and the cells are rounder. The part between the lateral thorns is rather elevated. A thin median ridge runs from near the anterior margin of the metazona to a short distance before the apex. The colour of the prono-

tum is yellowish brown, the borders and a transverse band on the elevated part between the humeral thorns are dark brown.

The head is of the ordinary shape in the genus. The fastigium verticis is transverse, deeply incised in the middle so as to divide it into two distinct tubercles. The angle formed between these tubercles is slightly over 90°. The eyes are prominent, globulous. The antennal scrobes are situated between the fastigium verticis and the eyes and reach towards the face with a thin semicircular ridge. The antennae are somewhat longer than the total length. They are uniformly yellowish.

In side view the pronotum shows the lateral lobe which is almost quadratic with a smooth anterior margin, a ventral margin which is crenulated in the anterior half and smooth in the caudal half which runs evenly curved to the hind margin to end in the humeral angle. This humeral angle is rather sharply bent posteriorly. The lateral surface of the posterior part of the pronotum tapers caudally. It is about 4½ times as long as it is broad at the humeral angle. The ventral edge is smooth. On the dorsal edge the thorns, described above, are found. The big complex humeral thorn is situated slightly before the middle of the pronotum.

The tegmina (fig. 1) are slightly longer than twice their breadth, broadest at the base of the apical third. Except for a slight curve at the base the anterior and posterior margins are almost straight up to the broadest part of the elytra. From this region the fore margin is curved slightly backwards towards the rounded apex. The posterior margin is curved more evenly to the apex. The straight portions of the tegminal margins are all faintly convex.

The venal pattern of the elytra is of the usual type in the subfamily. The costa reaches the anterior margin at about one fifth of its length. The subcosta is straight and reaches the fore margin just beyond the curve at one third from the top. The radial vein runs close to the subcostal vein for about three quarters of the latter's length. Then they diverge, the radial vein runs parallel with the fore margin and ends in this margin just before the apical curve. The radial vein has two branch veins, both of which are leaving the radial vein at acute angles, the first at about two fifths of the tegminal length from the base and the other at three fifths. This most apical vein is curved in its basal half, then runs straight to the apex and reaches it in the anterior part of the terminal curve. The other radial branch vein prolongs in its original direction for three quarters of its length, then ramifies into three branches, of which the anterior runs towards the posterior part of the apical curve, and the other two to the apical, curved part of the posterior margin. The medial vein bisects the angle between the

combined radial and subcostal veins and the posterior tegminal margin. It runs straight for about half the tegminal length, then it is curved evenly towards the posterior margin and reaches this margin at about one third from the top. It has two branches, one just before and one beyond its middle. They leave the main vein at acute angles and reach the posterior margin in the intermediate third part of its length. The cubital vein cannot be followed distinctly. It appears to be curved in various directions before it reaches the hind margin at one third of the length.

The secundary veins in the costal area, which occupies nearly one quarter of the surface of the tegmen, are all directed at an acute angle towards the top. They run almost parallel and they are all bifurcated before reaching the fore margin. In the rest of the tegmen the secondary and tertiary veins form an intricate network. Nearly all cells bear a brown spot in their centre.

The wings are transparent, almost as long as the tegmina. They are of the normal shape in the genus, broadest in the basal half.

The legs are long and slender. The anterior legs are almost 1½ times as long as the pronotum, the intermediate legs are 1¾ times that length and the posterior legs are as long as the elytra. The armament of the legs is as follows:

anterior legs: femora dorsally smooth, ventrally with 3 thorns on the inner edge and 4 on the outer edge; the tibiae bear 1 to 2 small spines dorsally and on the ventral carinae 6 and 8 spines on the inner and outer one respectively (on the outer carina 3 spines are grouped together apically).

intermediate legs: femora dorsally smooth, ventrally with 4 to 5 thorns on the inner and outer edges; the tibiae bear 1 to 2 small thorns on the dorsal outer edge and 4 on the dorsal inner edge; ventrally they bear 7 of these spines on the inner margin and 8 on the outer, three of which are grouped close together near the apex.

posterior legs: femora long, slender, somewhat stronger and broader in their basal third, smooth dorsally, ventrally with 7 strong spines on the exterior margin and with 6 to 7 somewhat smaller ones on the interior margin; tibiae as long as the femora, bearing dorsally 7 small thorns on the outer edge and 11 on the inner edge, and ventrally 10 on the outer and 9 on the inner edge.

The genicular lobes of all legs terminate into a broad and acute thorn.

A full description of the ♂ abdominal appendages cannot be given as the apical part of the subgenital plate and of the cerci is lacking in the holotype. That what was left has been figured (fig. 2a and b). The subgenital plate is rather long and slender. It is broadest at the base, then narrows rather

abruptly to about half this width. At a short distance from this contraction the subgenital plate narrows again slightly and then proceeds almost parallelsided. Ventrally it is somewhat excavated. Nothing is known about the absolute length, neither about the apical incision nor about the styli. The cerci are long and slender as far as can be seen from the remaining part. They are compressed laterally. At lateral view they are broad near the base, strongly tapering before the middle of the part which is still present. The rest is nearly parallelsided. The cerci are bent upwards near the base. The shape of the remainders suggest that the apical part was straight or only very slightly curved. Dorsally the cerci bear a number of short blunt protuberances near the base. The supraanal plate is rather small and oval.

Measurements (in mm) of the holotype (♂), compared with the measurements given by Griffini and Karny of their specimens of *Sasima beccarii* Griff.:

	Holotype ♂ *versteegi*	Type ♂ *beccarii*	? ♀ *beccarii*
total length	77	88	87
length body	40	—	41
length pronotum	23.5	31	27.5
length anterior part (before the humeral thorn)	9.5	—	8.7
length posterior part (behind the humeral thorn)	14	—	18.8
breadth pronotum, including the humeral spines	18	18	18
largest breadth without humeral thorns	11.5	13.8	12.5
breadth pronotum anteriorly	4	—	—
length tegmina	69	75	74
breadth tegmina	30	31	30.7
length wings	65	—	—
length anterior femora	15.5	—	—
length anterior tibiae	15	—	—
length intermediate femora	18	—	—
length intermediate tibiae	18	—	—
length posterior femora	34	37	34.5
length posterior tibiae	34	—	—

According to Karny's key to the genera the present specimen undoubtedly belongs to *Sasima*. Inside the genus it runs to the group of species (1-2-3') including *angulipennis* Karny, *truncata* Brunner v. Watt. and *aruana* Kirby. The main character in this group is found in the large and equal thorns placed relatively close to each other on the posterior part of the pronotum (not alternately big and small thorn as in group 3), but in the present species the intervals between the thorns are much larger than in the three species mentioned above and the thorns are much stronger. Moreover there is a difference in the shape of the tegmina. In *versteegi* the apical part of the fore and hind margin is distinctly convex whereas in the other three species these parts are distinctly truncate or even concave and form a more or less projected apical lobe.

As the main character is found in the shape and armament of the pronotum *versteegi* cannot be placed into this group. 1′ is also excluded as the only species in this section, *S. amplifolia* Walk., has the lateral edges of the pronotum densely spinulose. So group 2′ including *S. beccarii* Griffini (1908, p. 644, described from the Key Islands) as only species, remains. In my opinion *versteegi* should be placed near this species though at first sight the short diagnosis in the key leaves doubt as to this place. On a closer

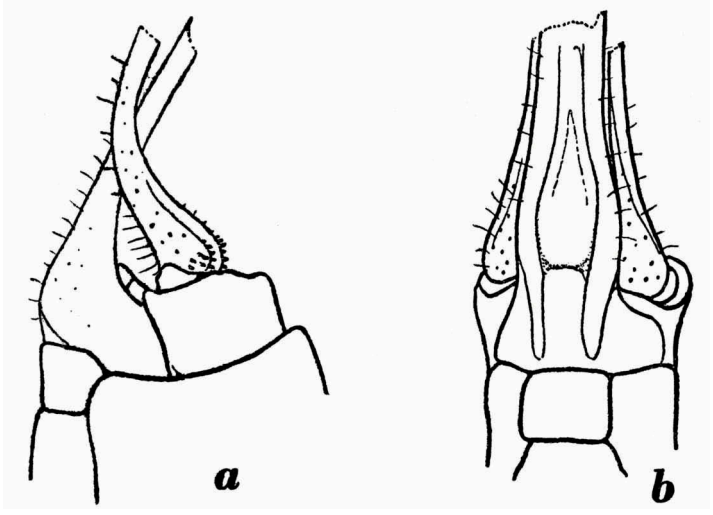

Fig. 2. *Sasima versteegi* nov. spec., ♂ holotype, abdominal appendages. a, lateral view; b, ventral view. × 7.

investigation, however, it becomes clear that the two species are closely related. The short diagnosis in the key runs: "Pars posterior pronoti tuberculis parvis valde distantibus armatum". In *versteegi* these small tubercles are substituted by strong spines. On a closer study of the descriptions made by Griffini and Karny of *S. beccarii* it becomes clear that in other characters there is a strong resemblance between the species, e.g., the shape and venation of the tegmina (Karny 1924, pp. 41-43, fig. 7), so *versteegi* should be placed near *beccarii.*

From *Sasima beccarii* Griff. the present species differs in some distinct details. Especially the shape and armament of the pronotum give sufficient differences to distinguish the species: whereas in *beccarii* the anterior part of the metazona (before the humeral thorns) of the pronotum is little narrower than the posterior part and has more or less rounded lateral margins, in *versteegi* the anterior part is distinctly narrower and the

lateral margins show a tendency to be concave. The posterior part of the metazona of the pronotum shows distinctly convex lateral margins in *beccarii,* whereas in *versteegi* these are almost straight. The thorns of the pronotum are much stronger developed in *versteegi* than in *beccarii.* especially the humeral thorns with secondary thorns at their bases, and those on the posthumeral margin of the metazona are fewer in number but much longer than in *beccarii.* After Karny's figure of *beccarii* (1924, fig. 7) there is some difference in the venation of the elytra, especially in the postradial area. In the basal half only two thinner and one stronger transverse veins are given off by the radial vein (R) in *versteegi* (in *beccarii*: 3 and 2). The first radial branch vein (Rs_1) is furcated in a different way, it shows one bifurcated branch towards the posterior margin (in *beccarii* it shows 3 stronger branches). Further there is only one stronger transverse vein between the first radial branch vein and the medial vein (M) at about the middle of the elytra (*beccarii* shows a second stronger transverse vein more distally, which unites the M with the first bifurcation of the first radial branch vein). The first strong branch vein of the M leaves more towards the middle of the M (in *beccarii* it originates at about one third of length of that vein).

Sasimella Karny

According to Karny's key to the genera the main difference between *Sasimella* and *Phyllophora* is found in the structure of the tympanal organs on the anterior tibiae. They are open (aperto) in *Sasimella* and slit-shaped (rimato) in *Phyllophora.* I have studied the available specimens of both genera on this character and after that I conclude that the genotype alone should remain in the genus *Sasimella* as here only the tympana are really open (fig. 3a-d). In *Sasimella aequifolia* Karny, of which species I had two cotypes (♂ and ♀) at my disposal, the tympani are halfway closed (fig. 3e-h) and they do not differ essentially from those of the specimens in the genus *Phyllophora.* As there are even specimens in which the aperture of the tympani is absolutely similar to that in the cotypes of *Sasimella aequifolia* I do not hesitate to place *aequifolia* into the genus *Phyllophora.* From Karny's key to the species of *Sasimella* and *Phyllophora* it was already obvious that the place of *aequifolia* was not altogether indebatable as the species was taken up in both keys.

As I could not study specimens of *Phyllophora keyica* Brunner von Wattenwyl, another species of *Phyllophora* which was placed by Karny in both keys, I cannot decide in which degree the tympani of this species are open. When we define precisely the difference between *Sasimella* and *Phyllophora*

in the first mentioned genus the tympani are without a trace of a shell-shaped cover, as wel internally as externally, in *Phyllophora* there are always distinct conchi or traces of them present at the ventral border of the tympani. A second distinct character is the armament of the posterior tibiae which bear only a few distinct thorns on the apical half (4-6, 7-8) in *Sasimella,* and a great number of thin thorns on that part, placed closely together, in *Phyllophora.*

Sasimella latifolia Karny (fig. 3 a-d)

Leiden Museum :

Soela Islands: 1 ♀, Tarip, 22 V 1914 (holotype) (ex Mus. Buitenzorg).

Phyllophora Thunberg

As to the differences of this genus against *Sasimella* I explained my views above.

One of the characters used by Karny in his key to separate the species in the genus, is the number of lateral thorns on the mesozona of the pronotum. This character, however, is subject to considerable variation. This variability has already been indicated by Karny as he placed *Ph. heurnii* Karny and *Ph. angustata* Brunner v. Watt. at two different places in the key. Of many species he had only one specimen at his disposal and probably this was the cause that some species or better specimens are placed rather isolated whereas with a larger series the variability of the character under consideration would have been more apparent and the interrelation of the species would have been better demonstrated. As an example I may mention *Ph. bispinosa* Karny (figs. 4 c-i). This species has been described on a specimen with only 2 thorns on the lateral margins of the pronotal mesozona (after Karny). In the Leiden collection specimens are present which undoubtedly belong to the same species, but which bear more than 2 thorns on the mesozona of the pronotum. When dealing with the species I shall give more details.

One new species in this genus is present in the Leiden Museum, only in one ♀ specimen. It is closely related to *Ph. longicerca* Karny, which, however, is only known in the ♂ sex. Probably a more extensive material will prove that both species belong together. At present I am not yet sufficiently certain on that point.

Phyllophora aequifolia (Karny) (figs. 3 e-h, 4 a-b)

Sasimella aequifolia Karny, 1924, Treubia, vol. 5, suppl., pp. 22, 54, fig. 11.

Leiden Museum:

Boeroe: 1 ♂, 1921, leg. L. J. Toxopeus (cotype) (ex Mus. Buitenzorg); 1 ♀, leg. H. Hendriks.

Aroe Islands: 1 ♀, Wammer, II 1907 (cotype) (ex Mus. Buitenzorg); 1 ♀, leg. D. J. Hoedt, acq. 1866.

The two not-typical specimens differ from the cotypes in the venation of the apical part of the tegmina. In the cotypes the radial vein runs straight

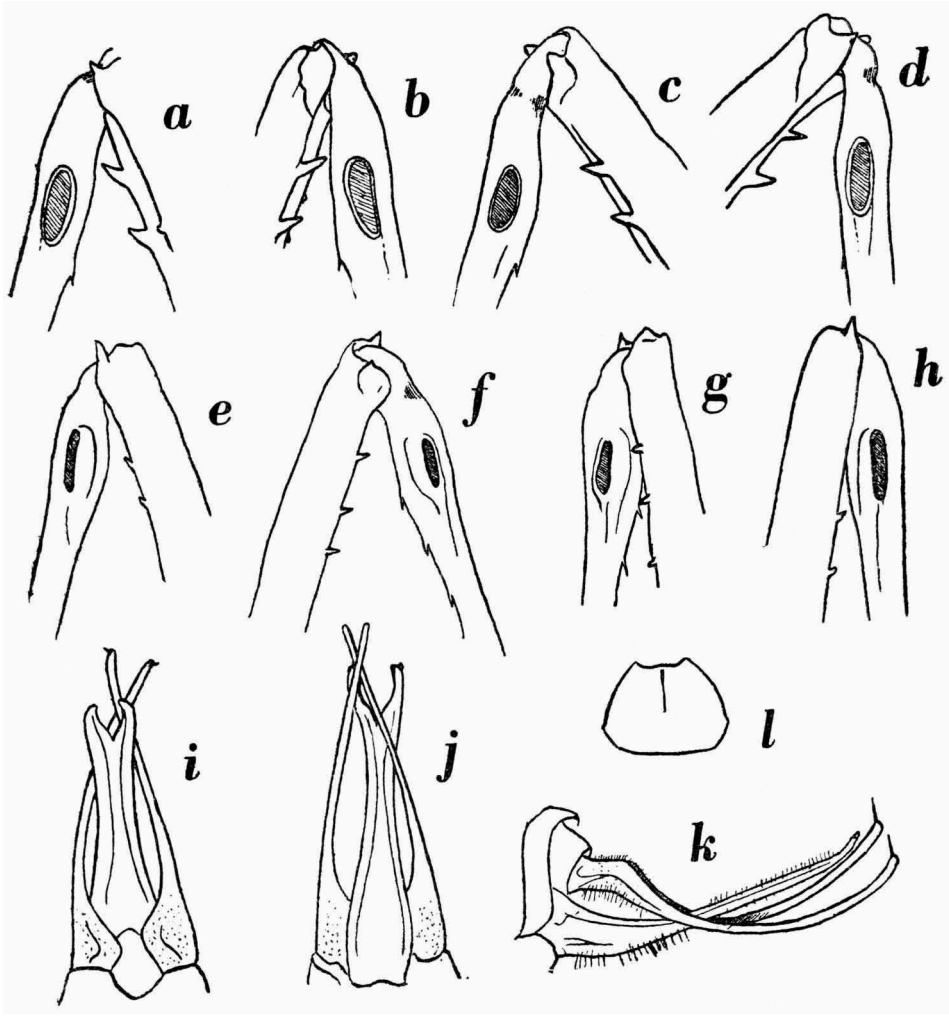

Fig. 3. a-d, *Sasimella latifolia* Karny, ♀ holotype, tympanal organs of anterior legs; a, left external, b, left internal, c, right internal, d, right external; e-h, *Phyllophora aequifolia* (Karny), ♂ cotype, tympanal organs of anterior legs; e, left external, f, left internal, g, right internal, h, right external; i-k, *Phyllophora bispinosa* Karny, ♂ plesioallotype, abdominal appendages; i, dorsal view, j, ventral view, k, lateral view; l, *Phyllophora bispinosa* Karny, ♀ cotype (lectoholotype), subgenital plate. × 5.

to the apical border, the subcosta and the 2nd radial branch vein leave at about the same place and at almost equal angles with the radial vein. In the

other two specimens the subcosta runs nearly straight to the apical border and the radial vein deviates with an acute angle and then gives off its branch vein.

The characters on which Karny separates *aequifolia* in his key of the genus *Phyllophora* appear to be discutable. The last tooth of prozona and metazona should be distinctly larger than the other teeth, and of about the same size as the humeral thorn. In the ♂ cotype (fig. 4b) this appears to be true, but in the ♀ cotype (fig. 4 a) the ultimate thorns of the pro- and mesozona of the pronotum are much smaller than the humeral teeth, and on the prozona they are even of equal size as the other prozonal thorns. In other species, e.g., *Ph. bispinosa* Karny the proportion of the thorns is very similar to that of *aequifolia*. There are, however, other differences to separate both species, e.g., the structure of the dorsal surface of the pronotum, which is coarser in *aequifolia* than in *bispinosa*. A second doubtful character used by Karny is the dentation of the anterior part of the metazona which should consist of alternately strong and small teeth. This character is more distinctly found in the holotype and some other specimens of *bispinosa* than in both cotypes of *aequifolia*. In the cotypes on the left border of the metazona the teeth are almost equal, and irregular on the right border (fig. 4 a and b).

As an argument to place *aequifolia* into the genus *Phyllophora* I used the presence of conchi on the ventral borders of the tympani. To illustrate the difference between those of the present species and the type species of *Sasimella* I figure the tympani, both internal and external of both species (fig. 3 a-h). These sketches will be sufficient to show clearly the difference in structure.

Phyllophora pellucida Karny

Leiden Museum:

New Guinea: 1 ♂, Moesairo, Geelvink Bay, beach forest, 14 VI 1912 (cotype) (ex Mus. Buitenzorg).

Phyllophora lanceolata Brunner von Wattenwyl

Leiden Museum:

Amboina: 1 ♀, leg. G. W. Müller (old label: *spinosa* Thunb.); 2 ♀ ♀, 1884, leg. D. J. Hoedt.

New Guinea: 1 ♀, Sepik River, Main Camp, 12 X 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11; 1 ? larva (damaged) (*Ph. lanceolata* Brunner v. Watt., sec. H. C. Blöte).

Phyllophora lanceolata Brunner v. Watt. var. **quinquedentata** Karny

Leiden Museum:

Amboina: 1 ♀, 28 VIII 1914 (holotype) (ex Mus. Buitenzorg).

Phyllophora acuminata Karny

Leiden Museum:

New Guinea: 1 ♂, South New Guinea, 1907 (holotype) (ex Mus. Buitenzorg).

Phyllophora filicerca Karny

Leiden Museum:

Key Islands: 1 ♂.

Amsterdam Museum:

New Guinea: 1 ♂, S. New Guinea, 1912/13, Kloofbivak, II 1913, leg. G. M. Versteeg.

Phyllophora erosifolia Karny

Leiden Museum:

New Guinea: 1 ♀, leg. F. H. ter Poorten (holotype) (ex Mus. Buitenzorg).

Phyllophora guttata Karny

Leiden Museum:

Ceram: 1 ♂, N. Ceram, Denin, VIII 1917 (holotype) (ex Mus. Buitenzorg).

Phyllophora picta Karny

Leiden Museum:

New Guinea: 1 ♀, Idenburg River, Prauwenbivak, XI-XII 1920, leg. W. C. van Heurn (holotype) (ex Mus. Buitenzorg).

Phyllophora parvidens Karny

Leiden Museum:

Frederik Hendrik Island: 1 ♀, III 1910 (cotype) (ex Mus. Buitenzorg).

Phyllophora bidentata Karny

Leiden Museum:

Ceram: 1 ♂, S. Ceram (holotype) (ex Mus. Buitenzorg).

Phyllophora longicerca Karny

Leiden Museum:

Ceram: 1 ♂, E. Ceram, I-II 1918 (holotype) (ex Mus. Buitenzorg).

Amsterdam Museum:

New Guinea: ? 1 ♂, S. New Guinea, 1912/13, 11 IX 1912, leg. G. M. Versteeg (the abdomen of the specimen is rather damaged, but all other characters agree with those of the holotype).

Phyllophora bispinosa Karny (figs. 3 i-l, 4 c-i)

Leiden Museum:

New Guinea: 1 ♀, Hollandia, 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11 (holotype) (ex Mus. Buitenzorg); 2 ♀♀ and 1 ♂ (plesioallotype), Hollandia, 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp.; 1 ♀ and 1 ♂, 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11.

Except the holotype of this species the Leiden Museum possesses a number of specimens which are very similar to it and which originate from the

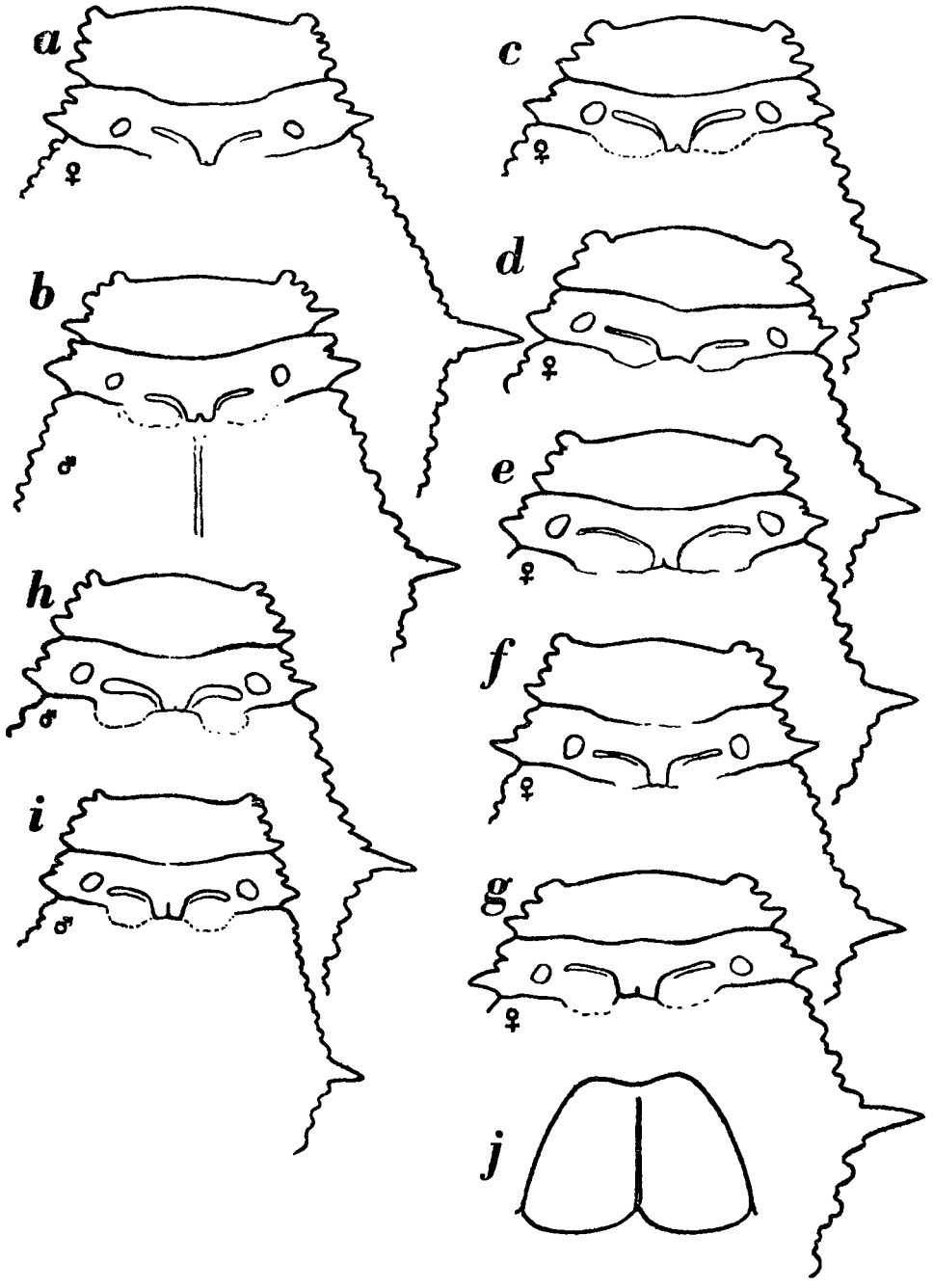

Fig. 4. a-b, *Phyllophora aequifolia* (Karny) ; a, anterior part of pronotum of ♀ cotype; b, anterior part of pronotum of ♂ cotype; c-i *Phyllophora bispinosa* Karny, anterior part of pronotum; c, holotype ♀, d-g, ♀ specimens, h-i, ♂ specimens (plesioallotype and paratype) ; j, *Phyllophora inusta* nov. spec., ♀ holotype, subgenital plate. × 5.

same locality. These specimens, however, do not agree with the holotype in the main character on which the name is based, viz., the two thorns on either side of the mesozona of the pronotum. The series of specimens shows some variation on this point and on closer inspection the holotype itself appears not to be bispinose, but it shows a very small thorn between the two distinct strong ones. The other specimens generally possess 3 subequal thorns, in a few cases the intermediate one is very small, like that of the holotype. The anterior part of the metazona shows some variation. The blunt thorns are stated to be subequal but often there is some regular alternation of smaller and larger ones. Often two small thorns are found between two larger ones.

Until now the ♂ of this species was not yet known. The short description follows here:

In general features the ♂ resembles the ♀ closely, it is more slender and a little smaller, which is apparent especially in the shape of the pronotum (fig. 4 h, i) and the tegmina [1]). The venal pattern of the tegmina is almost equal to that of the ♀♀ from the same locality. The hind border is more strongly curved than the anterior, which is faintly curved, except at the base and the apical part. The subcosta, radius and the 2nd radial branch vein diverge at almost the same place. A number of cells are ornated each with a small black dot in their centres. The tegmina and the pronotum of the 2nd ♂ specimen are for the greater part yellowish but they show parts of bright green near their posterior part. We may assume that the living animal was of a lively grass green. Spots of the same colour are found also in the ♀♀ collected by Dr. P. N. van Kampen.

The subgenital plate (figs. 3 i-k), is long, almost parallelsided in its posterior two thirds. Near its base it is nearly twice as broad as in the remaining part, then it tapers before the 2nd fifth of its length. The apical part is faintly broadened and distinctly incised. The incision is more or less heart-shaped. The two lobes thus formed are curved medially, each bearing a small stylus at the oblique apex. The cerci are long and very slender, broad and faintly rugose at the basal part, then strongly tapering and prolonged as a long thin stalk which is curved faintly upwards. They terminate into a thin acute thorn. The supra-anal plate is shield-shaped.

Phyllophora heurnii Karny

Leiden Museum:

New Guinea: 1 ♂ and 1 ♀, Idenburg Riv., Prauwenbivak, XI 1920, leg. W. C. van Heurn (cotypes) (ex Mus. Buitenzorg).

1) Karny's figure of the ♀ holotype (1924, fig. 25) is not correct. The borders of the metazona of the pronotum are straighter than figured. The anterior border of the tegmen too is less curved in the middle part.

The specimens I added to *Ph. bispinosa* Karny had formerly been identified as *Ph. heurnii* Karny after the armament of the mesozona of the pronotum. As I pointed out above this character is not altogether reliable to separate the species. In this case the shape of the pronotum is of more importance. The pronotum of *heurnii* is distinctly more slender than that of *bispinosa*.

Phyllophora inusta nov. spec. (figs. 4 j, 5)

Phyllophora inusta Dohrn in litt. in the Leiden Museum.

Leiden Museum:

Kaioa (near Batjan): 1 ♀, leg. H. A. Bernstein (labelled: *Phyllophora inusta* Dohrn) (holotype).

The general colour is light green, the pronotum and the tegmina are narrowly bordered with light brown. The venal pattern of the tegmina is faintly bordered with a somewhat darker greenish tinge. The tegmina are ornated in the postradial area with a few red-bordered chalk-white spots. These spots are not situated symmetrically on both tegmina. On the right tegmen a rather large spot is found in the fifth cell between the R and M; on the left this spot is not present. The other spots are very small and more or less scattered in the apical half between the radial vein and the medial vein, all lie in the centres of the cells. The head, the legs and the body are more or less yellowish in the type specimen. Probably some of these parts were light green when the animal was still alive.

The pronotum is of the normal lozenge-shape which is common in the genus. The pro- and mesozona are deeply punctured. The metazona is punctulated more superficially except along the prehumeral border, where the rather coarse punctulation of the pro- and mesozona is prolonged towards the humeral thorn. The lateral borders are strongly crenulated (blunt and short thorns). The prozona bears 4 crenules on either side, the 3rd on the right is very small. The armament of the mesozona is 3-3, of which the posterior thorn is largest and is provided with a small thorn dorsally on its base, more or less directed towards the sulcus between the meso- and metazona. The anterior part of the metazona (before the humeral thorn) bears a rather great number of blunt thorns (15-17 in the present specimen) which are about alternately larger and smaller (sometimes 2 small thorns are found between 2 larger ones). On the border of the posterior part of the metazona the crenules are subequal and about as densely set as on the anterior part (39-34). There is no distinct alternation, the crenules are of irregular size but they are implanted at almost equal intervals. The humeral thorn is rather strong and broad at the base. The borders of the pronotum are faintly convex. The dorsal surface of the pro-

and mesozona are flat, that of the metazona is somewhat inflated in the middle and in the anterior part. Towards the somewhat rounded posterior apex it is almost flat. A faint carina runs all over the pronotum. On the pro- and mesonotum it is very faint, but still visible. In lateral view the prehumeral and the posthumeral parts make an angle of about 135°. Laterally the metazona of the pronotum is rather broad, at the humeral thorn it is half as broad as the dorsal surface near that point. The lateral lobes are of the normal shape in the genus. They are crenulated along the ventral

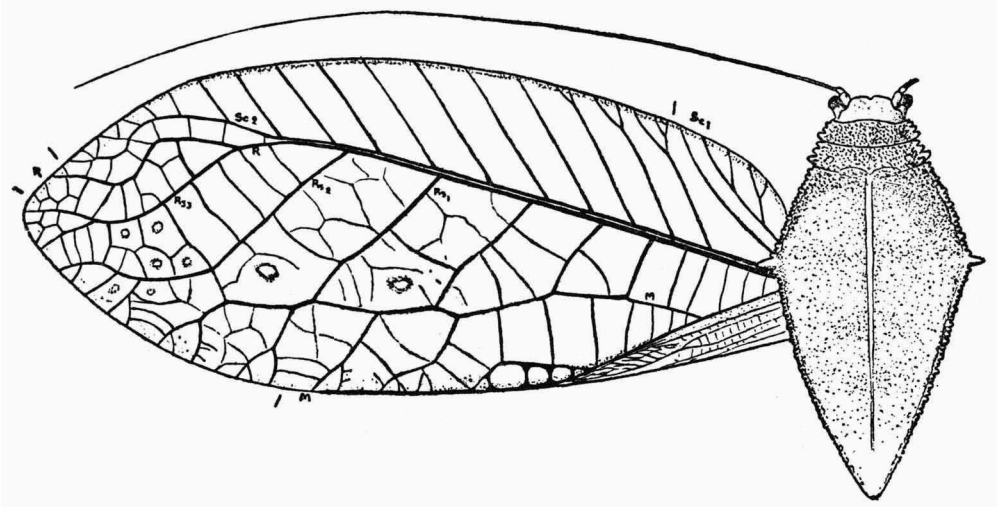

Fig. 5. *Phyllophora inusta* nov. spec., ♀ holotype, head, pronotum and left tegmen. × 1½.

border and along the ventral part of the anterior border. The angle between these borders is more than 100°. Posteriorly the basal border bends dorsally and passes with a faint curve into the posterior margin. This margin is nearly straight but for a small though distinct lobe before the humeral angle. From the humeral angle backwards the lateral border of the metazona is slightly curved at the base but nearly straight for the remaining part towards the apex. The lateral surfaces of the pro- and mesozona are coarsely punctulated like their dorsal surfaces, that of the metazona is finely punctulated.

The head is somewhat narrower than the anterior border of the pronotum, the dorsal surface is smooth with some distinct, impressed points. Towards the anterior margin of the vertex these points are placed more densely. The face and the genae too are densely punctulated. The angle be-

tween the vertex and the face is nearly straight. The eyes are brown, globular. The anterior border of the labrum is brown. The antennae are filiform, very slender, slightly shorter than the whole animal.

The tegmina (elytra) are rather broad, they are about 2¼ times as long as broad. The fore and hind borders are about equally curved, evenly in the basal two thirds and a little stronger towards the apex. The apical angle is smaller than 90° (about 75-80°). The tegmina are broadest at about $^1/_3$ from the apex. In this character the present species (♀) differs from *longicerca* Karny (♂), in which the tegmina are broadest in the middle. On the posterior margin a number of dark patches are found at more or less regular intervals, which are confluent near the apex. In the left tegmen the subcosta is straight, even where it diverges from the radial vein. The radial vein is curved a little backwards there, then it bifurcates, the posterior branch reaches the apex with a faint curve, the anterior branch bifurcates again and terminates in the anterior margin. The radial vein and the medial vein are interconnected with two strong transverse veins which are rather obvious, and three or four thinner ones more towards the base. The two branch veins of the radial vein run almost parallel with the two strong transverse veins. The medial vein reaches the first radial branch vein. It seems as if the medial vein runs more or less parallel with the radial vein and as if they are connected by three strong transverse veins. From comparison with other species it is clear how the situation of the veins really is. In the left tegmen the veins are still more aberrant. The apical part of the Sc and R is nearly conform with that of the left tegmen. From the R to the M there run a few thin transverse veins near the tegminal base, then there are two strong short transverse veins followed by a vein which may be a transverse vein as well as a branch of the R. Next to it runs the second branch vein of the R which can be distinctly recognized as such. In both tegmina the transverse veins in the praeradial area run from the subcosta to the anterior margin at an angle of about 45°. The cubital vein and those which follow are not of any systematical value at present, they are thronged together into a small triangular area which is covered at rest by the posterior part of the pronotum.

The wings are as long as the tegmina, they are wholly transparent, not coloured at their tips.

The legs are slender and rather long. The tibiae of all legs are only very slightly longer than the femora. The genicular lobes of all femora are small, ending in a small black thorn, the external lobes as well as the internal. The length of the anterior femora is equal to that of the prehumeral part of the pronotum, the length of the intermediate femora

is equal to the breadth of the pronotum without the humeral thorns, and that of the posterior femora is slightly more than the length of head and pronotum together. The armament of the legs is as follows:

anterior legs: femora dorsally smooth, ventrally with 5 small thorns on the inner edge and 8 on the outer edge; the tibiae are smooth dorsally and bear 6-8 small thorns on the inner ventral edge and about 7 on the outer (the terminal thorns are not included). The tympanal organs on the anterior tibiae are slit-shaped internally as well as externally.

intermediate legs: femora dorsally smooth, ventrally with 6 thorns on the inner and 6-7 on the outer edges; the tibiae bear 7 thorns on the ventral internal edge and 9 on the ventral external edge, dorsally they are smooth.

posterior legs: femora long, slender, somewhat inflated in their basal third, dorsally smooth, ventrally with $5^1/_2$-$7^1/_2$ thorns (I indicate the very small thorns on the end of a row as $^1/_2$) on the internal margin, and $14^3/_2$-$16^2/_2$ smaller thorns on the external margin; the tibiae are armed in a rather different way dorsally: on the external margin 28 thin sharp thorns are found, on the internal margin 20-12 rather strong thorns are found on the basal two thirds, the apical third is covered with a great many very thin thorns, like setae. Ventrally the armament is as follows: externally 15-13 and internally 7-7, these thorns are placed on the apical half.

The ovipositor is slender, evenly curved, about $^1/_6$ of the circumference of a circle. It is about equally broad over its whole length, only slightly tapering towards the top. The cerci are rather short, straight, cone-shaped. The subgenital plate is notched at the top, the lateral margins are faintly curved, medially there is a faint groove (fig. 4 j).

The posterior coxae are finely ridged transversally and the posterior part of the metasternum bears distinct crenules, these parts together seem to constitute a sound-producing organ.

Measurements of the holotype (in mm): total length 83, length of the body (shrivelled) 30, length of the pronotum $33^1/_2$, length anterior part of pronotum (before the humeral spines) (projection $12^1/_2$) $13^1/_2$, length posterior part of pronotum (behind the humeral thorns) (projection 21) 22, breadth of pronotum (humeral thorns included) $20^1/_2$, breadth of pronotum without humeral thorns 18, breadth of pronotum anteriorly $7^1/_2$, length of tegmina 68, breadth of tegmina $29^1/_2$, length of wings $65^1/_2$, breadth of wings 33, length anterior femora 15, length anterior tibiae 16, length intermediate femora $17^1/_2$, length intermediate tibiae $18^1/_2$, length posterior femora 37, length posterior tibiae 37, length ovipositor 29, breadth ovipositor 3.

As I pointed out above the species is closely related to *Ph. longicerca* Karny, of which, however, the ♂ only is known. A greater material of ♂ and ♀ specimens will be needed to decide whether *inusta* and *longicerca* belong together or not. For the present I consider them as different species which are distinguished after the shape of their tegmina.

Hyperhomala Serville

Hyperhomala variegata (Brunner von Wattenwyl)

Leiden Museum:

New Guinea: 1 ♂, Upper Sermowai, 30 III 1911, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11; 1 ♂, Jaona, near Tanahmerah Bay, IX 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11; 1 ♂, Sepik River, Pionierbivak, XII 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11.

Hyperhomala variegata (Brunner v. Watt.) var. **ornata** Karny

Leiden Museum:

New Guinea: 1 ♀, Idenburg River, Prauwenbivak, 1920, leg. W. C. van Heurn (cotype) (ex Mus. Buitenzorg); 1 ♂, Sepik River, Main Camp, 12 X 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11.

Hyperhomala variegata (Brunner v. Watt.) var. **ferrugata** Karny

Leiden Museum:

New Guinea: 1 ♂, Hollandia, 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11; 1 ♂, Tanahmerah Bay, beach forest, 18 VIII 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11.

Hyperhomala variegata (Brunner v. Watt.) var. **neptuni** Karny

Leiden Museum:

New Guinea: 1 ♂, N. New Guinea, X-XI (holotype) (ex Mus. Buitenzorg).

Phyllophorella Karny

Phyllophorella crassa Karny

Leiden Museum:

Tenimber Islands: 1 ♀, Olilit-Saumlakki, 1922 (ex coll. J. H. Jurriaanse).

Phyllophorella laevicollis Karny

Leiden Museum:

New Guinea: 1 ♀, Moesairo, Geelvink Bay, beach forest, 14 II 1912 (holotype) (ex Mus. Buitenzorg).

Phyllophorella subinermis Karny

Leiden Museum:

New Guinea: 1 ♂, Idenburg River, Pionierbivak, VI-VII 1920, leg. W. C. van Heurn (cotype) (ex Mus. Buitenzorg).

Siliquofera Bolívar

Siliquofera grandis (Blanchard)

Leiden Museum:

Aroe Islands: 1 ♀, 1863, leg. E. W. A. Ludeking.

New Guinea: 1 ♂ and 5 ♀♀, Hollandia, 1910, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11; 1 ♀ and 1 ♀ larva, leg. Dr. P. N. van Kampen, Nederl. Nieuw Guinea Exp. 1910/11; 1 ♂, 10 XI 1910, leg. K. Gjellerup, Nederl. Nieuw Guinea Exp. 1910/11; 2 ♀♀, Sekroe, MacCluer Bay, leg. K. Schädler (acq. 1897); 1 ♀, Poelau Pandjang or Noha Preka, VIII 1904, leg. J. W. van Nouhuys.

Locality unknown: 1 ♀.

Amsterdam Museum:

New Guinea: 1 ♂, North coast, between MacCluer Bay and Argoeni Bay.

Locality unknown: 1 ♀; 1 ♀ (ex coll. A. Mos) (very large specimen).

LITERATURE

CAUDELL, A. N., 1912. Phyllophorinae. Genera Insectorum, fasc. 138.

GRIFFINI, A., 1908. Phyllophorinae del Museo Civico di Storia Naturale di Genova. Zool. Anz., vol. 32.

KARNY, H. H., 1924. Monographie der Phyllophorinen. Treubia, vol. 5, suppl. (contains elaborate list of literature).

KIRBY, W. F., 1899. Notes on the Orthopterous Genus Phyllophora. Ann. Mag. Nat. Hist. (7), vol. 4.