CIVII.—NEW AND LITTLE-KNOWN SPECIES OF QUADRACEPS
(MALLOPHAGA) FROM PRATINCOLES, COURSERS AND
OTHER PLOVER-LIKE BIRDS.

By G. TIMMERMANN, D.Sc.

AMNH 12a V 5 1952

G. Timmermann on new species of Quadraceps

of the "circumfasciati" is broken into different pieces, the monotonous yellow-brown colouring of the body is replaced by a particular decorative pattern or the body has—in response to certain biological conditions (we do not know which)—acquired a very long, narrow form, as for instance in the case of Quadraceps hiaticulae on Charadrius hiaticula. Beside this prevailing "straightforward" directed phylogenetic evolution the genus repeatedly has tried to bring forth by a number of younger offshoots a big, heavily sclerotized special type of head-lice with a broad, "docophoroid" head and broad abdomen, of which the most outstanding results up to this time are known as the genera Cummingiella and Saemundssonia. Of these Cummingiella represents the more primitive and older, and Saemundssonia the more successful younger and probably also ecologically still more strongly specialized type.

Though there can be no doubt about the close relationships of the genera here under consideration, especially Cummingiella, s. str., and Quadraceps, s. str., as has been stated above, I am not prepared, however, to look upon Quadraceps without further notice as a synonym of Cummingiella.

Surely systematics has the task to express our insight into the relationship of species as precisely as possible, but on the other hand also the practical necessities are to be considered, and that would doubtless not be done if we unite species in the same genus which look as different as the forenamed Quadraceps hiaticulae and, for instance, Cummingiella longirostricola from the American long-billed Curlew. Before taking such a decision we should, therefore, enquire thoroughly once again whether we cannot erect a system, if necessary by introduction of further subgenera, which does not offer too much violence to the result of our scientific investigations but is also practical and well arranged. On the other hand, there is already at present something speaking for it, that the stout-bodied docophoroid type of the general facies of Cummingiella and Saemundssonia has originated several times independently from a "nirmoid" (Quadraceps) fundamental stock, which could mean that in "Cummingiella" we had not at all a phylogenetic unit before us, but a number of animals of the same direction of specialization and similar height of organization, but of different origin, which one is doubtless not allowed to cut off from their phylogenetic root-stocks by placing them into a separate genus.

The material upon which the following results of my investigations have been based was made available through the kindness of Miss Theresa Clay, British Museum (Nat. Hist.), London, and I should like to take this opportunity to express my best thanks for her continued valuable assistance. Though the material cannot claim to be complete in any respect, it is, nevertheless, adapted for enlarging our knowledge of the Quadraceps-species of the named hosts in a very gratifying manner and, moreover, permits some valuable hints on the phylogeny of their hosts, which, at the end of this paper, will be gathered up in some short references for the ornithological taxonomy.
Host-Group: Giarossidae.

Quadraepea princeps, sp. n.

Type-host: Rhinoptilus africanus hartingi.

Material: 5 males and 8 females from type-host, Somaliland, Febru

A very slender, nirnoid form (see fig. 1) of rather plain yellowish
colour. Head narrow, with broad hyaline eyeal border. Limbus

Fig. 1.

Quadraepea princeps, sp. n., on Rhinoptilus africanus hartingi. Male.

zygomatics interrupted laterally and in front, apart from this kept
close to its original from, in which this species differs from the other
known representatives of the genus, approaching certain (in this respect)
more primitive Degosriella- and Britella-species. The abdomen is charac-
terized by a clearly-developed through-running longitudinal septum,

which borders the limbus lateralis medially on both sides. The sternal
plates are roughly quadrangular central blocks which are rather darker
coloured than the tergal plates and make the latter, which are continuous
with the pleurites, difficult to see. The first tergal plate is divided in both
sexes, the second to sixth in the male and second to ninth in the female are
continuous, the rest divided. The sternal plate of the sixth segment
projects as a broad wedge on to the seventh.

The male genitalia consist of a weak basi-plate bounded by two
narrow sclerotized bars and rather symmetrical curved parameres, the
outlines of which form an oblong oval (the greatest diameter of the
apparatus lies in the middle). The endosomal complex becomes narrower
towards the hind-end and ends in two delicate endosomal teeth, between
which the long telomeres and the penis come forward.

I consider Q. princeps, sp. n., to be a very primitive species of the genus,
approaching the genus Lusaceps in different criteria.

Holotype male and allotype female, paratypes 4 males and 7 females,
data as listed above.

Measurements in millimetres.

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<thead>
<tr>
<th></th>
<th>Holotype (male)</th>
<th>Allotype (female)</th>
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<td>1·77</td>
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</table>

Total length of male genitalia 0·29; parameres 0·14. Cervical index
of the holotype 0·66, of the allotype 0·68. The measurements seem to
be rather variable.

Quadraepea schusteri, sp. n.

Type-host: Rhinoptilus c. chalcopertus.

Material: 2 males and 1 female from type-host, Kenya Colony, Oct.
1903, Meieritzch. Coll. (Brit. Mus.), No. 3721.

Similar to Q. princeps, but on the whole more progressively developed
(more " docophorid "). Head and abdomen broader, limbus zygomatics
more strongly simplified in direction towards the shape typical for the
stout-bodied forms, the first three abdominal tergite swith deep median
incisions, limbus lateralis without distinct internal limitation. Penis and
telomeres shorter and thinner. The parameres are less strongly curved
and form a connecting link to the type found in the following species.
Basal plate with distinct cross-bar.

Holotype male and allotype female, another male paratype, data as
listed above.
G. Timmermann on new species of *Quadraeops*

**Measurements in millimetres.**

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<thead>
<tr>
<th></th>
<th>Holotype (male)</th>
<th>Allotype (female)</th>
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<td>Abdomen</td>
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<tr>
<td>Total</td>
<td>1-57</td>
<td>1-96</td>
</tr>
</tbody>
</table>

Total length of male genitalia 0-29; parameres 0-13. C. I. in both sexes 0-78.

This new species is named in honour of Mr. Ludwig Schuster, Vice-President of the German Ornithological Society, as an acknowledgment for his ornithological investigations in Tanganyika Territory (formerly German East Africa) in the years before the first world war.

*Quadraeops lotus* (Nitzsch). In Giebel, 1866.


**Type-host:** *Ceurusius cursor*.


A rather slender, nirmolic species, quite well shown in Möjberg’s plate I, fig. 4. Cephalic index of male 0-67, of female 0-70. In the shape of the body in general more primitive than in *schusteri*, in the decorative pattern, on the other hand, more advanced. Parameres and endomeral complex more compact and shorter than in the species from *Rhinoptilus*, in this respect resembling the two following species, showing the "*Pluvius*" type. The outlines of the parameres appear pyriform in inactive position (the greatest diameter of the apparatus lies at the base of the parameres). Total length of male genitalia 0-28; parameres 0-12.

There is, in my opinion, no compelling reason to consider *Nirmus cursorius* of Möjberg as a separate species. The description of Giebel is indeed quite insufficient and partially obviously wrong, but the mistakes are easy to discern as such. (For instance, his remark "temple-borders without setae" is doubtless caused only by the fact that, on his single specimen, the setae had been broken off.) If we would not recognise the name of Nitzsch because of this objection, we would consequently have to do the same also in a considerable number of similar cases. At all events, in my opinion there is nothing in Giebel’s description which would exclude the use of the name *Q. lotus* (Nitzsch) as well for Mőjberg’s *Nirmus cursorius* as for the species examined by me.

*Quadraeops ellipticus* (Nitzsch). In Giebel, 1866.

**Type-host:** *Glaerola pratincola*. 1030


I identify my specimens with this species, which I herewith restrict to *Glaerola pratincola*. Regarding the development in the direction of the "docophorid" type, *Q. ellipticus* shows a case of parallel evolution to *Q. schusteri*, though representing on the whole a more progressively developed stage than the latter. C. I. in both sexes 0-81. The two first abdominal cross-bars (tergal plates) deeply incised or divided. Colouring rather monotonous yellow-brown with dark bordering. Total length of male genitalia 0-22; parameres 0-11.

The form parasitic on the Indian *Glaerola lactea* is very close to that on *Glaerola pratincola*, but seems to be somewhat smaller on the average, especially to possess smaller and comparatively wider heads (C. I. in both sexes 0-83), as may be seen from the following measurements. Because I could examine not more than one batch of *Quadraeops* each from the two species of pratincolas, I dare not decide whether the characteristics mentioned are of subspecific value or only those of a population. Nevertheless, I should like to refer to these differences.

<table>
<thead>
<tr>
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<th>Width of the head</th>
<th>Length of the head</th>
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</thead>
<tbody>
<tr>
<td><em>Glaerola pratincola limbata</em></td>
<td>0-43–0-48 (3-45)</td>
<td>0-94–0-98 (4-45)</td>
</tr>
<tr>
<td><em>Glaerola lactea</em></td>
<td>0-38–0-41 (3-39)</td>
<td>0-88–0-91 (4-20)</td>
</tr>
</tbody>
</table>

Quadracops alexandrinus (Giebel), 1874.

**Type-host:** *Pluvius negripinus*.


A heavily sclerotized, deep dark brown, robust species of "docophorid" type. The broad, somewhat protruding clypeus has in front a broad hyaline border, which is nearly rectangular. An excellent mark of this species is the clypeal signature which is characterized by four more or less striking bright spots, as shown in fig. 2. On the occupit the bands are arranged in a manner typical for the type, viz., the dorsal, anteriorly diverging occipital bands are strongly developed. The hinder outline of the occupit is a wavy line, almost rectilinear on the whole.

The prothorax and pterothorax show no characteristic particularities.

The dark-bordered abdomen is marked by broad transverse brown cross-bars (tergal plates) which follow one after the other without any remarkable intermediate space. The cross-bar of the first (visible) segment is medially divided, the cross-bar of the second one shows a deep median incision. Besides this, in the male the dorsal cross-bars of the 6th and 7th segments are also divided in the middle.

The male genitalia (see fig. 3) are of the same type described under *Q. lotus*. I consider *Q. alexandrinus* to be phylogenetically the youngest,
i.e., the most progressed and specialized, of the five Quadraceps species from glareoline hosts discussed above.

Neotype male and neallotype female, neoparatypes 6 males and 10 females, data as listed above.

Measurements in millimetres.

<table>
<thead>
<tr>
<th></th>
<th>Neotype</th>
<th>Neallotype</th>
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<tbody>
<tr>
<td></td>
<td>(male)</td>
<td>(female)</td>
</tr>
<tr>
<td>Length</td>
<td>Width</td>
<td>Length</td>
</tr>
<tr>
<td>Head</td>
<td>0·20</td>
<td>0·58</td>
</tr>
<tr>
<td>Prothorax</td>
<td>0·10</td>
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<tr>
<td>Pleurothorax</td>
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<td>0·16</td>
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<tr>
<td>Abdomen</td>
<td>0·70</td>
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</tr>
<tr>
<td>Total</td>
<td>1·45</td>
<td>1·93</td>
</tr>
</tbody>
</table>

Total length of male genitalia 0·26; parameres 0·12. C. I. in both sexes 0·83.

Host-Group: Dromadidae.

Quadraceps brunnea (Nitzsch). In Giebel, 1866.

Type-host: Dromas ardeola.


Q. brunnea, to which species I refer the above-named specimens, represents a quite particular type of the genus, which does not agree closely with any of the known species. Also the shape of the male genitalia is quite peculiar and shows, considered under a more comprehensive point of view, certain reminiscences of the state found in the species parasitic on Haematopus and Rostrocal, whereas the development of the abdominal decorations suggests that of species found on Larus (Q. punctatus) and Stercorarius (Q. normifer). Further aviparasitological relations, especially to the Charadriidae and Scolopacidae, are not to be found. It must be emphasized that there is a distinct sexual dimorphism in this species, which I know in a similar strongly-developed form only in Q. nycthemerus on Sterna minuta, the males being brown, the females yellowish white with dark decorations. The head is comparatively pointed, the clypeal signature medially notched. The males have the last two segments of the antennae dark-coloured, the females only the terminal one. In the female the dark bordering of the temples is confined
to a dark spot behind the antennal cavity. There are two strong temporal setae on each side in both sexes. The blackish-brown bordering of the 2nd–7th abdominal segments possesses the shape of a kind of blunt triangle in the male as well as in the female. In the female there is on the 5th abdominal segment medially a small yellow-brown spot and on the 6th segment a large one. The terminal segment of the female is divided in the middle and on each tip there is a small yellow-brown spot too. The terminal segment of the male has the outline of a semicircle; the hind part of it is occupied by a dark transverse half-moon shaped spot.

The male genitalia are very characteristically formed; they are shown in fig. 4.

Neotype and neallotype male and female from Somaliland, dates as listed above, the remaining specimens neoparatypes.

**Measurements in millimetres.**

<table>
<thead>
<tr>
<th></th>
<th>Neotype (male)</th>
<th>Neallotype (female)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Length</td>
<td>Width</td>
</tr>
<tr>
<td>Head</td>
<td>0-57</td>
<td>0-46</td>
</tr>
<tr>
<td>Prothorax</td>
<td>0-14</td>
<td>0-31</td>
</tr>
<tr>
<td>Pterothorax</td>
<td>0-17</td>
<td>0-41</td>
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<tr>
<td>Abdomen</td>
<td>0-80</td>
<td>0-84</td>
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<tr>
<td>Total</td>
<td>1-68</td>
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Total length of male genitalia 0-44; parameres 0-20.

**Host-group:** Scelopacidae.

*Quadriceps solitarius*, sp. n.

Type-host: *Aechmorhynchus parvirostris*.

Material: 5 males and 2 females from type-host, Paumotu Group (South Seas), Meinerzth. Coll. (Brit. Mus.), No. 12568.

This plain-looking little species possesses no excelling marks of any sort. The clypeus is anteriorly limited by a broad and convex running hyaline border, the head on the whole intermediate between the "nimrroid" and "docophoroid" types. The coni are long and pointed. The abdomen bears broad median cross-bars, which are separated from the dark lateral borders on both sides by a bright zone. The cross-bar (tergal plate) of the 7th segment of the male is strongly narrowed mediarily and divided in the middle.

The basal plate is limited by two slender sclerotized bars, which are connected by a cross-bar. The parameres are also weakly sclerotized, rather symmetrically curved and end in a fine point. The endomeral complex forms an oblong oval, which terminally runs out into two converging points, between which the penis and the accompanying telomeres come forward. Into the external border of the endomeres are cut off distally on both sides two inconspicuous steps, from which probably very delicate setae sprout forth (see fig. 5).

G. Timmermann on new species of *Quadriceps* 1035

Holotype male and allotype female; paratypes four males and one female, data as listed above.

![Fig. 5.](image)

*Quadriceps solitarius*, sp. n., on *Aechmorhynchus parvirostris*. Male genitalia.

**Measurements in millimetres.**

<table>
<thead>
<tr>
<th></th>
<th>Holotype (male)</th>
<th>Allotype (female)</th>
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<td></td>
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<tr>
<td>Prothorax</td>
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<td>Pterothorax</td>
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<td>0-24</td>
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<tr>
<td>Abdomen</td>
<td>0-58</td>
<td>0-33</td>
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<tr>
<td>Total</td>
<td>1-17</td>
<td></td>
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</tbody>
</table>

Total length of male genitalia 0-27; parameres 0-12; C.I. of the holotype 0-72, of the allotype 0-71.

**Host-group:** Thinocridae.

*Quadriceps meinerzthageni*, sp. n.

Type-host: *Attagis m. malouinus*.

Material: 1 male and 1 female from skin of type-host, Straits of Magellan, Meinerzth. Coll. (Brit. Mus.), No. 16154.

Head in both sexes longer than wide, clypeus short, shaped as in fig. 6, antennae in the male apparently thicker than in the female (squeezer !), two strong setae on each side of the temples.

On the hind margin of the prothorax there is one seta, of the pterothorax 7–8 setae on each side, of which the 3rd and 5th are the strongest.

A pigmented mesosternal plate is present in both sexes.
In the 1st (visible) segment of the female there is a vestige of a tergal plate in the form of a short "deeply chitinized circular band" (Carriker) projecting into the 2nd segment, in which respect Q. meintzehageni agrees closely with punensis. The sternal plate of the 6th segment projects as a median wedge onto the 7th. The long narrow last sternites of the female reach far into the lobes of the deeply incised end-segment. Between the former there is a dark slot in the penultimate segment. The dark pleurites bordering the abdomen are separated from the median crossbars (sternites) by a broad hyaline zone. The male genitalia are similar to those of Q. punensis, but because the quality of the preparation did not allow the making of an exact drawing, I have only figured the outlines of the paramere (fig. 3).

Holotype male and allotype female, data as listed above.

**Fig. 6.**

Quadraceps meinztzehageni, sp. n., on Aulagie m. malouinus.

Head and paramere of male.

Measurements in millimetres.

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<th>Allotype (female)</th>
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<tr>
<td>Head</td>
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<td>Pterothorax</td>
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<td>0·30</td>
</tr>
<tr>
<td>Abdomen</td>
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<td>(0·22)</td>
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Length of parameres 0·12; C. I. of the holotype 0·89, of the allotype 0·94.

I dedicate this new species in gratitude and admiration to Colonel R. Meinztzehagen in London, the famous ornithological enquirer and collector, whose enormous Mallophaga collection (now presented to the British Museum (Nat. Hist.)) has been the foundation of a great deal of my studies in bird lice.

**Host-Group:** Stercoraridae.

Quadraceps normifer stellarispolaris, sp. n.

Type-host: Stercorarius pomarinae. Material: 3 males and 8 females from type-host, N.E. Siberia, Meinertz, Coll. (Brit. Mus.), No. 19078.

An investigation of the three Quadraceps-populations parasitic on Stercorarius parasiticus, S. pomarinae and S. longicaudus proved (in agreement with the ornithological report) all to be very closely related and doubtless belonging to one and the same species (Q. normifer). In detail, the populations from S. parasiticus and S. longicaudus are so close to each other that I cannot separate them by means of the material compared. On the other hand, the specimens from S. pomarinae are evidently more widely spaced, as may be seen from the cephalic index (C. I. of male in specimens from parasiticus and longicaudus about 0·81-0·83, in specimens from pomarinae 0·90-0·92).

Holotype male and allotype female, paratypes 2 males and 7 females, data as listed above.

**Some Hints about Phylogeny and Ornithological Taxonomy.**

On the basis of the rules of parallel development between parasite and host, from the experience gained with the genus Quadraceps, the following statements can be made concerning the different host-groups parasitized by the genus named above. Of the four genera of the Giroleidae Rhinoptilus (especially R. africanus) proves to be the most primitive aviparasitologically and Pluvianus the most developed and specialized, whereas Curvorius and Glareola in different respects take an intermediate position. Dendrogalea shows certain relationships to Haematopus, Rostrulata, Larus and Stercorarius, but without joining more closely to one of these genera. The genus Aechnorhinorhynchus of the Sculopodidae does not show any striking primitive marks. The Thincoridae seem to be less primitive than separately developed. Of the three species of the genus Stercorarius, S. parasiticus and S. longicaudus are very close to one another, whereas S. pomarinae stands farther apart.

Finally, I should like to emphasize that the conclusions drawn above are valid, only in so far as the so-called rules of Fahrendholz and Sidrat are valid, and that they draw the picture for the bird groups in question as it results from the study of the genus Quadraceps. This last remark will mean that the phylogenetic situation of the hosts may look differently, seen from the perspective of other genera of parasites, but I am inclined to believe that the genus Quadraceps in general reflects the relationships of its hosts rather correctly.

**References.**


