

♂. Palpi maxillares cfr. fig. IV, 9—10.

Long. corp. mm 10,2; lat. thoracis 2,5; long. antennarum 14, palporum maxillarium 3,65, pedum paris tertii 3,38, stilorum segmenti quinti 0,40, stilorum segmenti noni 1, cerci mediani 12, cercorum lateraliū 4,8.

Habitat. Java: Nongkodjadar (Edv. Jacobson legit).

Observatio. Species haec a *M. gravehi* oculorum et maris palpi maxillaris forma bene distincta est.

2. A new species of Gregarine from North American Diplopods.

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(With 2 figures.)

eingeg. 22. März 1912.

This species of gregarine was first taken from specimens of the Diplopod *Paraiulus venustus* Wood, collected at the base of Green Mountain near Boulder, Colorado, at an altitude of about 6000 feet, on October 30, 1911. Six of the twenty specimens were infested, each with twenty-five or more gregarines. Two specimens of this same Diplopod out of five taken in Boulder on November 12, 1911, by Miss Rosamond Patton also contained this gregarine. On December 5, 1911 it was again found in two out of seven specimens of *Orthomorpha gracilis* (Koch) collected by Prof. T. D. A. Cockerell in a local greenhouse. These Diplopods were hosts for but twelve gregarines, eight in one and four in the other. As this Diplopod is an introduced species, occurring in Boulder only in greenhouses, and as *Orthomorpha* is a genus of another family, the Polydesmidae, the presence of the same gregarine in both *Paraiulus* and *Orthomorpha* is the more interesting. Of the other gregarines of the United States known from Diplopods only one, *Stenophora larvata* (Leidy), is recorded from Diplopods belonging to genera of different families. Two other collections of *Orthomorpha gracilis* were examined from the greenhouse but no gregarines were found. These Diplopods were taken February 8 and February 23, 1912. Since the Paraiulids collected on Green Mountain were reasonably well removed from any chance infection from spores dropped by the Polydesmids and as the native Paraiulids in Boulder were found infested with this gregarine it seems safe to consider it a native species. It is worthy of note however that the spores of this gregarine are capable of developing into normal gregarines in either of the two Diplopods.

Stenophora robusta nov. spec.

Type 153 μ total length; length of protomerite 24 μ ; width of deutomerite 67 μ ; Boulder, Colorado, U. S. A. (Ser. Nr. 2).

Average individuals $140\ \mu$ to $180\ \mu$.

Hosts, *Paraiulus venustus* Wood and *Orthomorpha gracilis* (Koch), Diplopoda.

Habitat, any portion of the posterior two-thirds of the alimentary canal.

Length of the protomerite 7 to 8, greatest width of protomerite 4 to 5,25 in the length of the deutomerite; greatest width of the deutomerite 2 to 2,25 in the total length of the gregarine.

Protomerite small, dome-shaped or conical, widest at its junction with the deutomerite, evenly joined to the deutomerite so as to appear almost as a continuation of the deutomerite, often with a slight concavity in the extreme apical portion.

Deutomerite large and rather regularly oval, region of greatest width approximately equidistant from the anterior end of the protomerite and the posterior end of the deutomerite; septum distinct, either straight or slightly concave on the side of the protomerite.

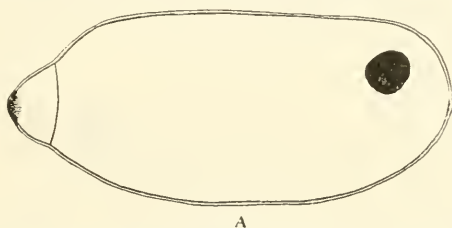


Fig. 1 A. Drawn from a cleared and mounted specimen. Shaded area in the apical portion of the protomerite indicates the extent of the expanded sarcocyte. The apparent pore in the epicyte is in the center of this area. Length, $143\ \mu$.

Nucleus spherical, faintly visible or obscured in living specimens very distinct in cleared specimens, often with one or more karyosomes.

Epicyte thin and rather firm, with an apparent pore in the apical region of the protomerite.

Sarcocyte distinct over the entire animal, of rather uniform thickness throughout, (being about three times as thick as the epicyte), except at the apex of the protomerite where it fills a shallow, conical space which extends away from the apex.

Endocyte fairly clear in all parts of the gregarine, but especially so in the protomerite.

Cysts spherical, composed of a densely granular central mass covered by a clear layer. Average total diameter $114\ \mu$, granular portion $84\ \mu$, clear portion $30\ \mu$.

None of the gregarines of this species were observed to bend the body in any direction and the form was never changed. They were always of a very constant shape, and solitary.

Stenophora robusta may be distinguished from the other two species of *Stenophora* known from the United States by the following key:

A. Small species, average individuals under $170\ \mu$; body robust; deutomerite broad, oval and regular, its greatest width 2 to 2,25 in the length of the deutomerite; body rather rigid.

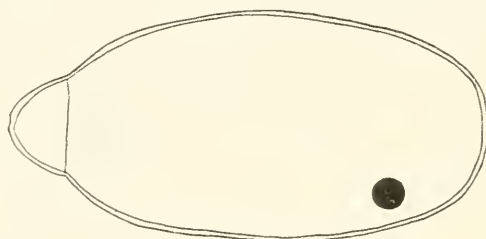
S. robusta nov. spec.

AA. Large species, average individuals over $250\ \mu$, maximum length nearly 1 mm; body elongate; deutomerite cylindrical or flask-shaped; greatest width 3,5 to 5 in the total length, (in flask-shaped individuals, rarely 2): body very flexible.

B. Host Diplopoda.

S. larrata (Leidy).

BB. Host the cricket, *Gryllus abbreviatus*. *S. erratica* Crawley.
The two species *S. larrata* and *S. erratica* are separated here on the



B

Fig. 1 B. Drawn from a living specimen, showing the cup-like depression in the epicyte at the end of the protomerite. This was observed in about one-fourth of the individuals. Length, $173\ \mu$.

basis of host only, as Crawley in his original description¹ makes the suggestion that *S. erratica* may be but an aberrant form of *S. julipusilli* (Leidy) resulting from the development of the spores of that species in an unusual host, the cricket. Accordingly this species must be more fully studied. The only other species with which *S. robusta* might be confused is *Amphoroides fontariae* Crawley. This species according to Crawley² at times assumes a shape somewhat similar to that of *S. robusta*. This form of *Amphoroides fontariae* however is without the apparent pore in the protomerite and does not have the correct measurements for *S. robusta* the protomerite being from 4 to 4,25 in the deutomerite.

In view of the variety of gregarines, of which nine species have been referred to the genus *Stenophora*, which have been found in European Diplopods, it seems well to list the North American species known

¹ Proc. Acad. Nat. Sci. Philad., Vol. LIX, Pt. II, p. 221, 1907.

² l. c., Vol. LV, Pt. I, pl. I, fig. 14, 1903.

from the same group. But six species have been recorded from North American Diplopods and of these but two are species of *Stenophora*. On the other hand four genera, *Gregarina*, *Stenophora*, *Cnemidospora* and *Amphoroides* are represented. It is entirely probable that the known gregarines of North American Diplopods are but a small part of the total number parasitic in these forms.

Gregarinidae.

1) *Gregarina calverti* Crawley.

Crawley, Proc. Acad. Nat. Sci. Philad., Vol. LV, Pt. I, p. 49, pl. II, fig. 19—21, 1903, (Wyncote, Penn., from *Lysiopetalum lacterium*); l. c., Vol. LV, Pt. III, p. 638, pl. XXX, fig. 15, 1903.

2) *Gregarina polydesmi virginensis* Leidy.

Leidy, Trans. Amer. Phil. Soc., Vol. X, N.S., p. 238, pl. 10, fig. 23—29, 1853, (Pennsylvania, from *Polydesmus virginensis*).

Crawley, Proc. Acad. Nat. Sci. Philad., Vol. LV, Pt. I, p. 45—46, pl. II, fig. 35, 1903, (Wyncote, Penn., and Raleigh, N.C., from *Polydesmus virginensis*).

3) *Cnemidospora spiroboli* (Crawley).

Stenophora spiroboli Crawley, Proc. Acad. Nat. Sci. Philad., Vol. LV, Pt. I, p. 51—52, pl. II, fig. 22, 1903, (Raleigh, N.C., from *Spirobolus* sp.).

Cnemidospora spiroboli Crawley, l. c., Vol. LV, Pt. III, p. 638—639, pl. XXX, fig. 7—9, 1903.

Stenophoridae.

4) *Stenophora larvata* (Leidy).

Gregarina larvata Leidy, Proc. Acad. Nat. Sci. Philad., Vol. IV, p. 232, 1848, (Pennsylvania, from *Iulus marginatus*).

Gregarina julimarginatae Leidy, Trans. Amer. Phil. Soc., Vol. X, N.S., p. 237, pl. 10, fig. 1—20, 1853.

Gregarina julipusilli Leidy, Trans. Amer. Phil. Soc., Vol. X, N.S., p. 238, pl. 10, fig. 21—22, 1853, (Pennsylvania, from *Iulus pusillus* Say.).

Stenophora juli Crawley, Proc. Acad. Nat. Sci. Philad., Vol. LV, Pt. I, p. 51, 1903, (from *Iulus* sp. and *Paraiulus* sp.).

Stenophora julipusilli Crawley, l. c., Vol. LV, Pt. III, p. 634, pl. XXX, fig. 16—17, 1903, (Eastern U.S., from *Iulus*, *Paraiulus* and *Lysiopetalum lacterium* Say.; Hall, Studies Zool. Lab. Uni. Nebraska, No. 77, p. 149, 1907, (Lincoln, Nebraska).

5) *Stenophora robusta* sp. nov.

Boulder, Colorado, from *Orthomorpha gracilis* and *Paraiulus venustus*.

Actinocephalidae.

6) *Amphoroides fontariae* Crawley.

Crawley, Proc. Acad. Nat. Sci. Philad., Vol. LV, Pt. I, p. 53, pl. I, fig. 12—14, 1903, (Wyncote, Penn., and Raleigh, N.C., from *Polydesmus* sp. and *Fontaria* sp.).

3. Entwicklung und phylogenetische Bedeutung des Medianauges bei Crustaceen.

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(Mit 9 Figuren.)

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Bei einem großen Teil der Crustaceen existiert zeitlebens in der Medianebene des vorderen Kopftheiles ein unpaariges Organ, das infolge

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