

Nachdruck verboten.
Übersetzungsrecht vorbehalten.

Contributions to our knowledge of the Freshwater Algae of Rangoon, Burma, India.

I. Euglenaceae from Rangoon.

By

B. V. Skvortzov (Harbin, Manchoukuo).

With plates 9—12.

The following note on Euglenaceae from Rangoon, Burma has resulted from the examinations of two samples (No. 175, 584) of plankton collected from pools in 1936 by Prof. Dr. L. P. KHANNA of Biological Department, University of Rangoon.

As far as I know the Euglenaceae from this part of India have not been listed and so may be of interest. In the course of a careful examination of many slides I have listed and described about 56 forms of *Euglena*, *Phacus*, *Lepocinclis* and *Trachelomonas*. In addition to these some extremely doubtful forms occur, which for the present are omitted, as they require considerable further investigation. The following general features may be pointed out in connection with this Euglenaceaea flora. 1. *Euglena* species from Rangoon are similar with European species; 2. *Lepocinclis* are almost represented by new forms; 3. Genus *Phacus* was very rich both species and individuals and almost was identical with European one; 4. Genus *Trachelomonas* was represented by 34 different forms, from which 18 are proposed as new to science. Our contribution is illustrated by diagrams made by the author with E. LEITZ, Apochromat 2 mm. and Compens Okular 4.

The description of species.

Genus *Euglena* EHRENB.

Euglena acus EHRENB. Pl. 9 Fig. 1.

Euglena acus EHRENB., LEMMERMANN, E., Eugleninae (1913) 129, Fig. 209.

Body spindle-shaped. Anterior end rounded, about one half or one third of body diameter. Posterior is ending by a pointed tip. Cuticle striated. Paramylons large, elongate and numerous. Length, 0.159 mm.; breadth, 0.01. Common.

Euglena acutissima LEMM. Pl. 9 Fig. 2.

Euglena acutissima LEMM., LEMMERMANN, E., Eugleninae (1913) 129—130, Fig. 210.

Body spindle-shaped, extremely elongate. Posterior end tapered, produced into a colorless, pointed tip. Cuticle smooth. Chromatophores disc-shaped, numerous in spiral rows. Paramylon grains two in number, large, longitudinally arranged. Length, 0.101 mm.; breadth, 0.0068. Pointed tip about 0.025 mm. in length. Common.

Euglena oxyuris SCHMARDA. Pl. 9 Fig. 3.

Euglena oxyuris SCHMARDA, LEMMERMANN, E., Eugleninae (1913) 130, Fig. 207.

Body cylindrical, long and slightly compressed. Anterior end rounded, posterior tapered, produced into a colorless pointed tip. Cuticle yellowish-green, distinctly striated in spiral fashion without punctuation. Chromatophores green, disc-shaped, small and numerous. Paramylon capsule-shaped, two in number from the both sides of the nucleus. Length, 0.1356 mm.; breadth. 0.029. Common.

Euglena spirogyra EHRENB. Pl. 9 Fig. 4.

Euglena spirogyra EHRENB., LEMMERMANN, E., Eugleninae (1913) 131, Fig. 208.

Body cylindrical, anterior end rounded, obtuse; posterior end produced into a long, colorless, acute tip, distinctly set off from the main body. Cuticle yellowish green, spiral striated, covered with distinct knobs. Chromatophores green, disc-shaped, numerous, scattered throughout the body. Paramylons 2, large, capsule-shaped. Nucleus central. Length, 0.06 to 0.136 mm.; breadth, 0.012 to 0.017. Common. Reported from Europe, Asia and America.

Genus *Lepocinclis* PERTY.

Lepocinclis ovum (EHR.) LEMM. var. *punctate-striata* LEMM.
Pl. 9 Fig. 5.

Lepocinclis ovum (EHR.) LEMM. var. *punctate-striata* LEMM., Eugleninae (1913) 134,
Fig. 217.

Body ovate, gradually attenuate towards the both ends. Posterior end with a distinct acute point. Cuticle yellowish, striated in spiral fashion. Puncta indistinct. Chromatophores disc-shaped and numerous. Paramylon grains one in number, large and ringform. Length, 0.0306 mm.; breadth, 0.0187. Infrequent. Known from Europe.

Lepocinclis ovum (EHR.) LEMM. var. *palatina* LEMM. Pl. 9 Fig. 23.

Lepocinclis ovum (EHR.) LEMM. var. *palatina* LEMM., LEMMERMANN, E., Eugleninae (1913) 134, Fig. 218.

Body ovoid. Anterior and posterior ends broad rounded. Tube like neck on the anterior end distinct and a short point at the end of the posterior end. Cuticle yellowish, solid. Chromatophores disc-shaped and numerous. Paramylon grains large, two in number, forming ring-shaped curved bands. Common.

Lepocinclis indica sp. nov. Pl. 9 Figs. 6, 7, 8.

Cellulae fronte visa subglobosis, reniformis, a tergo concavae, cauda obtusa subito e basi corporis oriente. Parte anteriore levissime deplanata, angulis rotundatis. A letere globosa. Membrana luteo, spiraliter striata. Chlorophora viridia, numerosa, discoidea. Granulae paramylaceae 2 anuliformes, curvatae. Cellulae longis 0.0238 mm.; latis 0.018. Habit. In aquis dulcis prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA.

Body ovoid, triangular. Anterior end attenuate and broad rounded. Posterior end broader and abrupt and in the middle part of it the body is tapering, produced into a acuminate point. Cuticle is solid, yellowish striated in spiral fashion. Chromatophores little disc-shaped and numerous. Paramylon grains-two in number, large, curved and forming ring-shaped bands. Body length, 0.0238 mm.; breadth, 0.018. Infrequent. Our new species is to be compared with *Lepocinclis ovum* (EHR.) LEMM.

They are easily separable on the basis of relatives shapes.

Lepocinclis fusiformis (CARTER) LEMM. Pl. 9 Fig. 9.

Lepocinclis fusiformis (CARTER) LEMM., LEMMERMANN, E., Eugleninae (1913) 135, Fig. 219.

Body spindle-shaped or elongately ovoid. Anterior and posterior ends attenuate. Cuticle indistinctly striated. Chromatophores disc-shaped and numerous. Paramylon grains two in number, large and ringforming. Length, 0.037 mm.; breadth, 0.02. Infrequent.

Lepocinclis Khannae sp. nov. Pl. 9 Figs. 10, 11, 12.

Cellulae fusiformes, triangularis, vel subglobosa, utrimque valde angulata, in medio latissima, lateribus superne ad collum inferne, ad caudam rapide convergentibus, cauda acutissima. Membrana lutea longitudinale striata. Chlorophora viridia, numerosa et discoidea. Granulae paramylaceae 1, magna curvatae, discoidea. Cellulae longis 0.025—0.032 mm.; latis 0.0068—0.01. Habit. In aquis dulcis prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA.

Body spindle-shaped or elongately ovoid. Anterior end attenuate and abrupt. Posterior end tapered, produced into a colorless pointed tail-like tip. Cuticle thick, yellowish striated in longitudinal and somewhat in spiral fashion. Chromatophores disc-shaped small and numerous. Paramylon grains one only, large and discform. Flagellum ?. Length, 0.025 to 0.032 mm.; breadth, 0.0068 to 0.01. Common. Our species is to be compered with *Lepocinclis Marssonii* LEMM. a species reported from Europe. Named in honor of Prof. Dr. L. P. KHANNA, Rangoon.

Genus *Phacus* DUJARDIN.

Phacus torta (LEMM.) SKV. Pl. 9 Fig. 13.

Phacus torta (LEMM.) SKV., SKVORTZOV, B., Euglenaceengattung *Phacus* DUJ. (1928) 110, Taf. 2 Figs. 9, 10.

Body broad ovoid and spiral twisted. Anterior end attenuate. Posterior end tapering, produced into a twisted point. Cuticle spiral striated. Chromatophores disc-shaped and numerous. Paramylon grains a large ringforming disc. Length, 0.073 mm.; breadth, 0.034. Common.

Phacus torta (LEMM.) SKV. var. *tortuosa* SKV. Pl. 9 Fig. 14.

Phacus torta (LEMM.) SKV. var. *tortuosa* SKV., SKVORTZOV, B., Euglenaceengattung *Phacus* DUJ. (1928) 110, Taf. 2 Fig. 11.

Body spiral twisted. Anterior end broad and slightly attenuate. Posterior end with wavy tapering margin, produced into a colorless, pointed tip. Cuticle spiral striated. Chromatophores disc-shaped and

numerous. Paramylon grains large and discform. Length, 0.077 mm.; breadth, 0.03. Differs from the type in its body largely spiral twisted. Common. Known from Europe.

***Phacus longicauda* (EHR.) DUJ. Pl. 10 Fig. 2.**

Phacus longicauda (EHR.) DUJ., SKVORTZOV, B., Euglenaceengattung *Phacus* DUJ. (1928) 111, Taf. 2 Fig. 12.

Body elongate-ovoid, compressed in cross-section. Anterior end broad rounded, not narrower than body diameter. Posterior end produces into a long, colorless point. Cuticle distinctly striated in longitudinal fashion. Chromatophores disc-shaped and numerous. Paramylon grains one in number, round and very large and several small. Length, 0.121 mm.; breadth, 0.044. Very common.

***Phacus longicauda* (EHR.) DUJ. var. *insecta* KOCZWARA. Pl. 9 Fig. 16.**

Phacus longicauda (EHR.) DUJ. var. *insecta* KOCZWARA, Phytoplankton der Dobrostaný Teiche, Kosmos 40, 1915; *Phacus Morii* SKV. var. *insecta* (KOCZWARA) SKVORTZOV, Die Euglenaceengattung *Phacus* DUJ. (1928) 109, Taf. 2 Fig. 2.

Differs from the type in presence of one impression from the both sides of the body. Length, 0.136 mm.; breadth, 0.047. Infrequent. Known from Europe.

***Phacus longicauda* (EHR.) DUJ. var. *indica* var. nov. Pl. 9 Fig. 15; Pl. 10 Fig. 1.**

Cellula elliptica, parte anteriore rotundata, lateris *insecta*, parte posteriore caudis rectis praedita. Membrana longitudinale striate. Chlorophora viridia, numerosa, discoidea. Granula paramylacea magna, discoidea. Cellulae longis 0.093 mm.; latis 0.017—0.025. Habit. In aquis dulcis prope Rangoon, India. Legit. Dr. L. P. KHANNA.

Body elongate-ovoid. Anterior end broad rounded or slightly narrower than body diameter. Posterior end produced into a short point. About in the middle part of body margin from both sides distinct impressions. Cuticle striated in longitudinal fashion. Chromatophores disc-shaped and numerous. Paramylon grains large and discform. Length, 0.093 mm.; breadth, 0.017 to 0.025. Common. Differs from var. *brevicaudata* SKV. having the impression from both sides of the membrane.

***Phacus alata* KLEBS var. *indica* var. nov. Pl. 9 Figs. 17, 18.**

Cellula ovalis, triangulata, interdum parte anteriore sensim attenuata, parte posteriore latior, angulato, caudis parvis et rostratis

praedita. Chlorophora viridia, numerosa, discoidea. Granula paramylacea 2, discoidea, magna. Cellulae longis 0.03—0.032 mm.; latis 0.025—0.0255. Habit. In aquis dulcis prope Rangoon, India. Legit. Dr. L. P. KHANNA.

Body ovoid, something triqueter in size, attenuate and rounded. Posterior end very broad and abruptly passing in a short acute and oblique tip. Cuticle?. Spiral stria ted. Chromatophores disc-shaped and numerous. Paramylon grains 2 in number, discform. Length, 0.03 to 0.032 mm.; breadth, 0.025 to 0.0255. Infrequent. Differs from the type in its triqueter shape of the body. The type is reported from Europe.

***Phacus Lemmermannii* (SWIR.) SKV. Pl. 9 Fig. 19.**

Phacus Lemmermannii (SWIR.) SKV., SKVORTZOV, B., Euglenaceengattung *Phacus* DUJ. (1928) 114, Taf. 2 Figs. 30, 31.

Body ovoid. Anterior end slightly attenuate. Posterior end enlarged and abruptly obliquely acuminate. Cuticle distinct, stiated in spiral fashion. Chromatophores small and disc-shaped. Paramylon grains two in number, large and discform. Length, 0.032 mm.; breadth, 0.022. Infrequent. Reported from Europe and Eastern Asia.

***Phacus pleuronectes* (O. F. M.) DUJ. var. *citriformis* DREZEPOLSKI. Pl. 10 Fig. 3.**

Phacus pleuronectes (O. F. M.) DUJ. var. *citriformis* DREZ., SKVORTZOV, B., Euglenaceengattung *Phacus* (1928) 115, Taf. 2 Fig. 36.

Valve oval-elliptical. Anterior end broad rounded. Posterior end abruptly attenuate, produced in to a short oblique point. Cuticle spiral striated. Chromatophores discoidal and numerous. Paramylon grains one in number, ring-shaped. Infrequent. Know from Europe.

***Phacus triqueter* (EHR.) DUJ. Pl. 10 Figs. 4, 5.**

Phacus triqueter (EHR.) DUJ., SKVORTZOV, B., Euglenaceengattung *Phacus* DUJ. (1928) 117, Taf. 2 Figs. 45, 56.

Body ovoid, twisted, from the vertical view triangular. Anterior end slightly attenuate and rounded. Posterior end enlarged and abruptly produced into a short twisted point. Cuticle spiral striated. Chromatophores discform and numerous. Paramylon grains two or several in number and discform. Very common. Known from Europe and Asia.

***Phacus brevicaudata* (KLEBS) LEMM.** Pl. 9 Figs. 20, 21.

Phacus brevicaudata (KLEBS) LEMM., SKVORTZOV, B., Euglenaceengattung *Phagus* (1928) 117, Taf. 2 Fig. 48.

Body ovoid. Anterior end broad rounded and in median part twisted. Posterior broad or slightly attenuate, tapering into a short tip. Cuticle? Chromatophores discform and numerous. Paramylon grains 1 or 2. Length, 0.017 to 0.02 mm.; breadth, 0.012 to 0.0136. Common. Reported from Europe.

***Phacus pyrum* (EHR.) STEIN.** Pl. 9 Fig. 22.

Phacus pyrum (EHR.) STEIN, SKVORTZOV, B., Euglenaceengattung *Phacus* (1928) 118, Taf. 2 Fig. 49.

Body elongate-ovate, circular in cross section. Anterior end rounded; posterior tapered and produced into a very long, slender, colorless tail-like tip. Cuticle striated in spiral fashion. Paramylon grains small. Length, 0.0306 mm.; breadth, 0.01. Very common and variable in size and relative shape.

***Phacus pekinensis* SKV. forma.** Pl. 10 Fig. 6.

Phacus pekinensis SKV., SKVORTZOV, B., Euglenaceengattung *Phacus* DUJ. (1928) 119, Taf. 2 Fig. 53.

Body ovoid triangular. Anterior end broad rounded; posterior tapering and produced into a acuminate point. Cuticle distinctly striated in spiral fashion. Chromatophores small and disc-shaped, numerous. Paramylon grains small and large. Length, 0.05 to 0.059 mm.; breadth, 0.022 to 0.0255. Common. Our specimens are larger than the Chinese forms. Known from North China.

***Phacus setosa* FRANCÉ var. *crenata* SKV.** Pl. 10 Fig. 7.

Phacus setosa FRANCÉ var. *crenata* SKV., SKVORTZOV, B., Euglenaceengattung *Phacus* DUJ. (1928) 119, Taf. 2 Fig. 55.

Body ovoid, spiral twisted with wavy margins. Anterior end broad and rounded; posterior tapering and produced into a colorless pointed tip. Cuticle distinctly spiral striated. Chromatophores disc-shaped and numerous. Paramylon grains two in number, large and ringform. Length, 0.0425 mm.; breadth, 0.017. Not common.

***Phacus oscillans* KLEBS.** Pl. 10 Fig. 8.

Phacus oscillans KLEBS, SKVORTZOV, B., Euglenaceengattung *Phacus* DUJ. (1928) 121, Taf. 2 Fig. 63.

Body elliptical-ovoid and little. Anterior end broad rounded. Posterior gradually attenuate, tapering into a short nipple-like tip.

Cuticle smooth. Chromatophores discform. Paramylon grain one in number, disc-shaped. Length, 0.018 mm.; breadth, 0.006. Common. Reported from Europe and Asia.

***Phacus indica* sp. nov.** Pl. 10 Fig. 9.

Cellula ovalis, a tergo spinis hyalinis rectis praedita. Interdum parte anteriore sensim attenuata, lateris 1—2 insecta, undulata. Membrana longitudinale striata. Chlorophora viridia, numerosa et discoidea. Granula paramylacea 2 in centrum cellulae. Longis 0.04 mm.; latos 0.025. Habit. In aquis dulcus prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA.

Body ovoid and slightly twisted from the ventral view, compressed. Anterior end slightly attenuate and rounded. Posterior end tapering, produced into a short straight pointed tip. The margin in the middle part of the body from one side interrupted, from another side with interruptions two in number. Cuticle striated in slightly spiral fashion. Chromatophores discform and numerous. Paramylon grains two in number also discform. Length, 0.04 mm.; breadth, 0.025. Infrequent. Our species is to be compared with *Phacus orbicularis* HUBNER and var. *caudata* SKV. They are easily separable on the basis of size and relative shape.

Genus *Trachelomonas* EHRENB.

***Trachelomonas volvocina* EHR.** Pl. 10 Fig. 10.

Trachelomonas volvocina EHR., LEMMERMANN, E., Eugleninae (1913) 145, Fig. 246.

Shell spherical, 0.0136 to 0.0142 mm. in diameter with a aperture for the flagella of 0.0017 mm. in breadth. Membrane brown and smooth. Chromatophores 2. Common. Ubiquist.

***Trachelomonas volvocina* EHR. var. *derephora* CONRAD?** Pl. 10 Fig. 11.

Trachelomonas volvocina EHR. var. *derephora* CONRAD, G. DEFLANDRE, Monogr. du Genre *Trachelomonas* (1926) 55, Figs. 7, 8.

Shell spherical, 0.0085 mm. in diameter with a distinct short tube-like neck of 0.0012 mm. in breadth. Membrane brown, smooth. Chromatophores 2. Rare. Reported from Europe and Java.

***Trachelomonas volvocina* EHR. var. *compressa* DREZEPOLSKI emend. DEFLANDRE.** Pl. 10 Fig. 12.

Trachelomonas volvocina EHR. var. *compressa* DREZEPOLSKI emend. DEFLANDRE, G. DEFLANDRE, Monogr. du Genre *Trachelomonas* EHR. (1926) 56, Fig. 27.

Shell spheroidal, flattened from upper and lower parts, 0.0136 mm. in length, 0.0153 in breadth. The aperture for the flagella wide,

about 0.002 mm. in breadth. Membrane brown and smooth. Chromatophores in distinct. Rare. Smaller than the type. Reported from Australia, Europe and Venezuela.

***Trachelomonas indica* sp. nov. Pl. 10 Fig. 13.**

Lorica globosa. Collo nullo. Membrana colore pleurumque obscuro, fusco, hyalina. Chloroplastis disciformibus, numerosibus, 38. Diametro loricae 0.0187—0.023 mm.; ore 0.0017—0.0019 latis. Habit. In aquis dulcis prope Rangoon, Burma, India. Ledit. Dr. L. P. KHANNA.

Shell spherical, 0.087 to 0.023 mm. in diameter. Membrane dark, light brown or reddish brown and smooth. The aperture for the flagella distinct, 0.0017 to 0.0019 mm. in breadth, without a tube-like neck. Chromatophores numerous, about 38, disciform. Common. Our species is to be compared with *Trachelomonas volvocinopsis* SWIRENKO with 10 chromatophores and spherical shell. Several varieties have been observed.

***Trachelomonas indica* sp. nov. var. *punctata* var. nov. Pl. 10 Fig. 14.**

Lorica formae typicae consimilis, minute autem membrana punctata. Chloroplastis numerosis. Lorica diametro 0.019—0.024. Habit. Cum formam typica.

Shell spherical 0.019 to 0.024 mm. in diameter. Membrane brown and punctate. Chromatophores about 35. Very common.

***Trachelomonas indica* sp. nov. var. *tubigena* var. nov. Pl. 10 Fig. 15.**

A forma typica ore introrsum levissime producto. Membrana rubra-brunnea. Chloroplastis 30—35. Diametro loricae 0.022—0.023 mm.; ore 0.0025 latus. Habit. Cum formam typica.

Shell spherical 0.022 to 0.023 mm. in diameter, reddish brown. The aperture for the flagella makes a tube like neck inside of the shell of 0.0025 mm. in breadth. Chromatophores about 30—35. Rare.

***Trachelomonas indica* sp. nov. var. *Khannae* var. nov. Pl. 10 Fig. 16.**

Lorica formae typicae consimilis minute autem granulata. Ore introrsum levissime producta. Diametro loricae 0.025—0.027 mm.; ore 0.0034 mm. latis. Chloroplastis 25—28. Habit. Cum formae typicum.

Shell spherical 0.025 to 0.027 mm. in diameter. The aperture for the flagella with a inner short tube-like neck. of 0.0034 mm. in

breadth. Membrane dark brown covered with irregular little sharp spines. Chromatophores about 25. Infrequent.

Trachelomonas indica sp. nov. var. *coronata* var. nov. Pl. 10 Fig. 18.

A forma typica loricae minute autem granulata. Collo quadrato denticulato instructa. Chloroplastis numerosis. Diametro loricae 0.018—0.019. Habit. Cum formam typicum.

Shell spherical 0.018 to 0.019 mm. in diameter. The aperture for the flagella with a straight serrated tube like neck of 0.0025 in breadth. Membrane brown, spinose. Chromatophores numerous.

Trachelomonas intermedia DANGEARD. Pl. 10 Fig. 17.

Trachelomonas intermedia DANGEARD, G. DEFLANDRE, Monogr. du Genre *Trachelomonas* (1928) 71, Fig. 157.

Shell subspherical or broad elliptical 0.014 mm. in length; 0.01 in breadth. The aperture for the flagella 0.0017 in breadth. Membrane brown and punctate. Chromatophores several. Common. Known from Europe, Venezuela and Manchuria.

Trachelomonas Richmondiae (PLAYFAIR) DEFLANDRE var. *indica* var. nov. Pl. 10 Fig. 19.

Lorica elliptico-subhexagona, fronte autem quam levissime attenuata, valde angulato, lateribus rectis subparallelis, inferne acuminato-lateribus planis rapide ad caudam rotundata convergentibus. Membrana brunnea punctata et spinis abtutis bacillaribus dense oblecta. Lorica longis 0.0289 mm.; latis 0.0102; oris 0.002 mm. latis. Habit. In aquis dulcis stagnalis prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA.

Shell long-elliptical, abruptly cuneate at the lower part and slightly attenuate and rounded at the upper parts. Length, 0.0289 mm.; breadth, 0.0102. The aperture for the flagella without a tube-like neck, 0.002 in breadth. Membrane brown, punctate and covered with sharp pointed spines. Chromatophores numerous. Infrequent. Our specimens are easily separable with the type on the basis of relative shapes. The type is known from Australia.

Trachelomonas subglobosa SKV. Pl. 10 Fig. 20.

Trachelomonas subglobosa SKV., SKVORTZOV, B., Description of new species of *Trachelomonas* from North Manchuria, China (1925) 340, Fig. 18.

Shell ovate with a broad rounded upper and slightly attenuate lower parts. Length, 0.0086 mm.; breadth, 0.006. Aperture for the

flagella is small. Membrane brown and smooth. Chromatophores 2. Infrequent. Known from Europe, Siberia, South China and Manchuria.

***Trachelomonas oblonga* LEMM.** Pl. 10 Fig. 21.

Trachelomonas oblonga LEMM., G. DEFLANDRE, Monogr. du Genre *Trachelomonas* EHR. (1926) 69, Fig. 121.

Shell spherical-elliptical. Length, 0.0119 mm.; breadth, 0.011. The aperture for the flagella 0.0017 mm. in breadth. Chromatophores several. Infrequent. Known from Europe, Africa, Java, China and Manchuria.

***Trachelomonas Drezepolski* SKV. var. *indica* var. nov.** Pl. 10 Fig. 22.

Lorica ovalis vel subglobosa vel plus minus quadrata, angulis rotundatis, fronte levissime deplanata. Collo brevi humillimo. Membrana brunnea, hyalina. Chloroplastis inconspicuous. Longis loricae 0.0068 mm.; latis 0.0051. Ore 0.0012 mm. latis. Habit. In aquis dulcis stagnalis prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA.

Valve broad oval, slightly attenuate at the base with a distinct tube like neck. Length, 0.0068 mm.; breadth, 0.005; neck 0.0012 mm. in breadth. Membrane brown and smooth. Chromatophores indistinct. Indian specimens are easily separable from the type on the basis of size and relative shape. *Trachelomonas Drezepolski* SKV. (1925) is known from Europe.

***Trachelomonas Drezepolski* SKV. var. *hispida* SKV.** Pl. 10 Fig. 23.

Trachelomonas Drezepolski SKV. var. *hispida* SKVORTZOV, Euglenaceengattung *Trachelomonas* EHR. (1925) 59, Taf. 8 Fig. 19.

Shell ovate with broader upper part. Length, 0.017 mm.; breadth, 0.0136. The aperture for the flagella 0.0017 mm. in breadth, without a tube-like neck. Membrane brown, covered with small pointed spines. Chromatophores numerous. Infrequent. Reported from Europe.

***Trachelomonas conica* PLAYFAIR var. *indica* var. nov.** Pl. 10 Figs. 24, 25.

Lorica cylindracea-oblonga, fronte quadrata, angulis rotundatis, postice leviter attenuata et late-rotundata. Collo nullo. Membrana brunnea et hyalina. Longis loricae 0.011—0.014 mm.; latis 0.007—0.0085; ore 0.0015 latis. Habit. In aquis dulcis stagnalis prope Rangoon, India. Legit. Dr. L. P. KHANNA.

Shell cylindrical with parallel margins in the middle, slightly attenuate at the base and subrectangular at the upper part. Length, 0.011 to 0.014 mm.; breadth, 0.007 to 0.0085. The aperture for the flagella 0.0015 in breadth. Membrane brown and smooth. Chromatophores several. Differs from the type in it more rounded ends. Var. *Indica* is easily separable from the type in the basis of the size and the shape of the shell end. Common. *Trachelomonas conica* is known from Australia, and Venezuela.

***Trachelomonas Stokezi* DREZEPOLSKI emend. DEFLANDRE. Pl. 10**
Fig. 26.

Trachelomonas Stokezi DREZEPOLSKI emend. DEFLANDRE, Monogr. du Genre *Trachelomonas* EHR. (1926) 72, Fig. 155.

Shell ovoid, broader at the upper and attenuate at the lower parts. Length, 0.0238 mm.; breadth, 0.017, with a distinct flagella aperture of 0.0034 mm. in breadth. Membrane light brown, irregularly punctate and scrobiculate. Chromatophores several. Rare. Reported from Europe and Africa.

***Trachelomonas similis* STOKES var. *hyalina* var. nov. Pl. 10**
Fig. 27.

Lorica formae typicae consimilis, hyalina nec punctata. Lorica ovalis vel elliptica, lateribus arcuatis, polis rodundatis. Membrana brunnea, hyalina nec punctata. Collo oblique. Longis loricae 0.0187—0.023 mm.; latis 0.015—0.0155; ore 0.002—0.0025 mm. latis. Habit. In aquis dulcis stagnalis prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA.

Shell elliptical-oval and rounded. Length, 0.0187 to 0.023 mm.; breadth, 0.015 to 0.0155, with distinctly curved tube like neck of 0.002 to 0.0025 mm. in breadth. Membrane brown, smooth not punctata. Chromatophores numerous. Differs from the type in its smooth not punctate membrane. Common.

***Trachelomonas similis* STOKES var. *indica* var. nov. Pl. 10**
Fig. 30.

Lorica formae typicae consimilis, minute autem granulata. Collo ad basim spinis robustis ornato. Longis loricae 0.022 mm.; latis 0.015; ore 0.0034 mm. latis. Habit. In aquis dulcis stagnalis prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA. Shell elliptical-ovate with rounded ends. Length, 0.022 mm.; breadth, 0.015, with a distinct curvate oblique tube-like neck 0.0034 mm. in breadth, surro-

unded by a thicken membrane. Membrane brown, covered with irregularly disposed little spines. Chromatophores numerous. Common. Differs from the type in the shape of the tube-like neck and the presance of little spines. *Trachelomonas similis* is known from North and South America.

***Trachelomonas paludosa* SKV. Pl. 10 Fig. 28.**

Trachelomonas paludosa SKVORTZOV, Über Flagellata aus Mandschurei. I. (1917) 71, Taf. 5 Fig. 3 a.

Shell elliptical-oval with attenuate upper and broad rounded lower parts. Length, 0.0289 mm.; breadth, 0.0153. The aperture for the flagella is wide, with a staight tube-like neck of 0.0042 mm. in length and 0.0031 in breadth. Membrane thick brown and distinctly punctate. Chromatophores numerous. Indian specimens are intermediate between the type and var. *elongata* SKV. known from North Manchuria. Infrequent.

***Trachelomonas superba* SWIRENKO emend. DEFLANDRE. Pl. 11 Figs. 1—3, 21.**

Trachelomonas superba SWIRENKO emend. DEFLANDRE, Monogr. du Genre *Trachelomonas* (1926) 84.

Shell elliptical with broad ends. Length, 0.034 to 0.0561 mm.; breadth, 0.028 to 0.032. The aperture for the flagella 0.0032 to 0.005 mm. in breadth. Membran thick, dark brown, punctate and covered with large pointed spines. Chromatophores numerous. Very common. Paramylon grains one large ring-shaped. Known from Russia, Polen, Venezuela, France and Manchuria.

***Trachelomonas Kelloggii* SKV. var. *effigurata* SKV. Pl. 11 Figs. 4, 20.**

Trachelomonas Kelloggii SKV. var. *effigurata* SKV., SKVORTZOV, B., Euglenaceen-gattung *Trachelomonas* EHR. (1925) 29, Taf. 2 Fig. 36; G. DEFLANDRE, Monogr. du Genre *Trachelomonas* EHR. (1926) 37, fig. 297.

Shell subspherical or broad elliptical with broad rounded ends. Length, 0.0374 mm.; breadth, 0.027. The aperture for the flagella is wide, without a tube-like neck and without a ring. Membrane dark brown, thick, punctate and granulate. Chromatophores numerous. Common. Known from China, Manchuria and Europe.

***Trachelomonas Khannae* sp. nov. Pl. 10 Fig. 29.**

Lorica ovalis vel subglobosa, ubique rotundata. Collo nullo. Membrana brunnea, spinis obtusis bacillaribus dense obtecta. Chloro-

plastis 3—5. Longis laricae 0.0136 mm.; latis 0.01; ore 0.0017 latis. Habit. In aquis dulcis stagnalis prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA.

Shell oval with broad ends. Length, 0.0136 mm.; breadth, 0.01. Membrane brown covered with small sharp pointed spines. The aperture for the flagella 0.0017 mm. in breadth without a straight tube-like neck. Chromatophores several, 3—5. *Trachelomonas elegans* CONRAD is to be compared with our new species. They are easily separable on the basis of the size and relative shapes of the shell. Named in honor of Dr. L. P. KHANNA.

***Trachelomonas Rangoonensis* sp. nov.** Pl. 11 Figs. 5, 6.

Lorica ovalis nel suboblonga, lateribus modice arcuatis nec planis, ibique rotunda. Collo lato humillimo instructa. Membrana dilute fulva scabra granulis humillinus obscuris sparse dispositis. Chloroplastis discoideis, numerosis. Lorica longis 0.022—0.0238 mm.; latis 0.017—0.0187; ore 0.005—0.0068 mm. latis. Habit. In aquis dulcis stagnalibus prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA.

Shell broad-ovate with rounded ends. Length, 0.022 to 0.0238 mm.; breadth, 0.017 to 0.0187, with broad distinct aperture for the flagella. Tube-like neck short of 0.005 to 0.0068 mm. in breadth. Membrane light brown, thick, irregularly scrobiculate. Chromatophores numerous. Common.

***Trachelomonas Rangoonensis* sp. nov. var. *curvata* var. nov.**
Pl. 11 Fig. 7.

Lorica formae typicae collo oblique differt. Longis loricae 0.0255 mm.; latis 0.0187; ore 0.0051. Habit. Cum formam typicum.

Differs from the type in it more distinct and curvate tube-like neck. Length, 0.0255 mm.; breadth, 0.0187. The neck 0.0051 mm. in breadth and 0.0025 in length. Chromatophores numerous. Infrequent with the type.

***Trachelomonas hispida* (PERTY) STEIN.** Pl. 11 Fig. 8.

Trachelomonas hispida (PERTY) STEIN, SKVORTZOV, on *Trachelomonas hispida* (PERTY) STEIN and its varieties. New Phytol. (1925) 300.

Shell brown, oval with rounded ends, covered with distinct sharp pointed spines. Length, 0.02 mm.; breadth, 0.017. The aperture for the flagella is wide without a tube-like neck. Infrequent. Reported from Europe, Asia and America.

***Trachelomonas hispida* (PERTY) STEIN var. *coronata-punctata* var. nov. Pl. 11 Figs. 9, 10.**

Lorica formae var. *coronata* LEMM., collo recto denticulato instructa. Membrana spinis obtusus bacillaribus et punctis sparse ornata. Longis loricae 0.034 mm.; latis 0.0187. Habit. In aquis dulcis stagnalis prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA.

Shell oval, brown. Length, 0.034 mm.; breadth, 0.0187. Distinctly punctate and covered large and small spines. The aperture for the flagella surrounded with a straight neck covered with pointed spines. Chromatophores num. Differs from var. *coronata* LEMM. in punctate membrane. Not common.

***Trachelomonas armata* (EHR.) STEIN var. *ovata* SWIRENKO. Pl. 11 Figs. 12—14, 18.**

Trachelomonas armata (EHR.) STEIN var. *ovata* SWIRENKO, SKVORTZOV, B., Euglenaceengattung *Trachelomonas* EHR. (1925) 42, Taf. 3 Fig. 48.

Shell ovate, broadly rounded at the ends. Length, 0.034 to 0.042 mm.; breadth, 0.025. Membrane dark brown punctate, at the upper part round. The aperture for the flagella covered with spines. The end spines and at the lower part are robuste and slightly curved. Chromatophores numerous. Common. Known from Europe and Manchuria.

***Trachelomonas armata* (EHR.) STEIN var. *indica* var. nov. Pl. 11 Fig. 11.**

Lorica var. *ovata* SWIR. consimilis, oris ad basi annulo incrassato pleurumque ornato, spinis posterioribus null. Longis loricae 0.0289 mm.; latis 0.0221; ore 0.0025 latis. Habit. In aquis dulcis stagnalis prope Rangoon, India. Legit. Dr. L. P. KHANNA.

Shell oval or elliptical with broad rounded ends. Length, 0.0289 mm.; breadth, 0.0221, with a aperture for the flagella 0.0025 mm. in breadth, with a distinct ringshaped neck. Membrane brown, thick, distinctly punctate, slightly spinose on the both ends. Longe spines at the end non. Chromatophores numerous. Infrequent. Differs from var. *ovata* SWIR. in presence of a ring neck and absence of long spines at the end of the shell.

***Trachelomonas cylindrica* EHR. Pl. 11 Figs. 15, 16.**

Trachelomonas cylindrica EHR., SKVORTZOV, B., Euglenaceengattung *Trachelomonas* (1925) 48—49, Taf. 4 Fig. 26.

Shell cylindrical, narrow, with rounded ends. Length, 0.0153 mm.; breadth, 0.0068, with little tube like neck of 0.0012 mm. in breadth.

Membrane brown and smooth. Chromatophores several. Common. Known from Europe, Siberia, Manchuria and Australia.

Trachelomonas cylindrica EHR. var. *punctata* SKV. Pl. 11 Figs. 17, 19.

Trachelomonas cylindrica EHR. var. *punctata* SKV., SKVORTZOV, B., Euglenaceengattung *Trachelomonas* (1925) 49, Taf. 4 Fig. 27.

Shell cylindrical, narrow. Length, 0.0153 mm.; breadth, 0.0068. The aperture for the flagella with a straight tube-like neck. Membrane brown, sparsely punctate. Chromatophores several in number. Common. Indian specimens are smaller than the type from Eastern Asia.

Trachelomonas urceolata STOKES var. *indica* var. nov. Pl. 12 Fig. 1.

Lorica formae typica consimilis vix cauda hyalina. Lorica corpore ovato, fronte rotundato, a tergo acuminato lateribus modice arcuatis; cauda hyalina instructa. Membrana dilute fulva, scrobiculata. Longis loricae 0.0225 mm.; latis 0.0187; oris 0.0051 latis. Habit. In aquis dulcis stagnalis prope Rangoon, India. Legit. Dr. L. P. KHANNA.

Shell oval. Length, 0.0255 mm.; breadth, 0.0187. Upper part passing directly into a short oblique and slightly serrated neck of 0.0051 mm. broad, lower part elongated, pointed. The point hyaline. Membrane light yellow or brown, slightly rugose. Chromatophores numerous. Differs from the type in hyaline end. Rare.

Trachelomonas gibberosa PLAYFAIR var. *indica* var. nov. Pl. 12 Figs. 2, 3.

Lorico corpore utrique inflato, depresso lateribus aequaliter rotundatis, cauda obtusa subito e basi corporis oriente. Collo recto elongato, ore minuta denticulato. Membrana rugosa, dilute fulva. Longis loricae 0.028—0.029 mm.; latis 0.018; collo 0.004 mm. latis. Habit. In aquis dulcis stagnalis prope Rangoon, Burma, India. Legit. Dr. L. P. KHANNA.

Shell rhomboidal oval. Length, 0.028 to 0.029 mm; breadth, 0.018. End contracted and pointed, upper part passing into long serrated neck of 0.004 mm. broad. Membrane rugose, light brown. Chromatophores numerous. Differs from the type in its rugose membrane and long tube-like neck. Common. *Trachelomonas gibberosa* PLAYFAIR was described from Australia.

***Trachelomonas zmiewika* SWIRENKO.** Pl. 12 Figs. 4, 5, 7.

Trachelomonas zmiewika SWIR., G. DEFLANDRE, Monogr. du Genre *Trachelomonas* (1926) 125—126, Figs. 763, 764, 772.

Shell ovate, constricted at both ends. Length, 0.034 to 0.042 mm.; breadth, 0.02 to 0.023. Upper part passing directly into a slightly serrated, straight or oblique neck, lower part abruptly, passing into a long point. Membrane light or dark brown, irregularly dotted. Common. Reported from Europe.

***Trachelomonas Nadsonii* SKV. var. *indica* var. nov.** Pl. 12 Figs. 9, 10.

Lorica formae typical consimilis, ovato-elliptica, lateribus superne ad collum rapide convergentibus, a tergo in caudam longam, acuminatum protracta. Collo longissimo, recto everso. Ore denticulata. Membrana brunnea, punctata et granulata. Lorica longis 0.05—0.055 mm.; latis 0.017; oris 0.005—0.0052 latis. Habit. In aquis dulcis stagnalis prope Rangoon, India. Legit. Dr. L. P. KHANNA.

Shell contracted at both ends. Length, 0.05 to 0.055 mm.; breadth, 0.017. Upper part is passing directly into a neck enlarged and serrated of about 0.005 to 0.0052 mm. in breadth and 0.008 to 0.0085 in length. Membrane dark brown, punctate and covered with irregular little broad spines. Differs from the type, known from northern Manchuria, in its punctate membrane and more broader neck. Common.

***Trachelomonas Swirenko* SKV. var. *polonica* SKV.** Pl. 12 Fig. 6.

Trachelomonas Swirenko SKV., SKVORTZOV, B., Euglenaceengattung *Trachelomonas* (1925) 77, Taf. 8 Fig. 40.

Shell ovate-elliptical, abruptly contracted at both ends. Length, 0.0272 mm.; breadth, 0.0119. Upper part passing directly into irregularly serrated neck with about 0.0034 mm. in breadth. Lower part short pointed. Membrane light brown, irregularly dotted. Chromatophores numerous. Infrequent. Known from Poland, Europe.

***Trachelomonas fluviatilis* LEMM.** Pl. 12 Fig. 8.

Trachelomonas fluviatilis LEMM., G. DEFLANDRE, Monogr. du Genre *Trachelomonas* (1926) 123, Fig. 723, 724.

Shell oval, constricted at both ends. Length, 0.0238 mm.; breadth, 0.0102. Upper part is passing directly into serrated neck which is about 0.0025 mm. in breadth. Lower part pointed. Membrane light brown, irregularly scrobiculate. Chromatophores several. Common. Known from Siam, Europe and Venezuela.

Literature cited.

- DEFLANDRE, G. (1926): Monographie du Genre *Trachelomonas* EHR. Nemours.
- KOCZWARA, M. (1915): Phytoplankton der Dobrostanty Teiche. Kosmos Bd. 40. Lwow.
- LEMMERMANN, E. (1913): Eugleninae from Die Süßwasser-Flora Deutsch., Öst. u. der Schweiz. Heft 2. Jena.
- SKVORTZOV, B. (1917): Über Flagellata aus Mandschurei. I. Teil. Journ. Microbiology. Vol. 4. Petrograd.
- (1925 a): Description of new species of *Trachelomonas* EHR. from North Manchuria, China. China Journal of Science Vol. 3. Shanghai.
- (1925 b): On *Trachelomonas hispida* (PERTY) STEIN and its varieties. New Phytologist. London.
- (1925 c): Die Euglenaceengattung *Trachelomonas* EHR. Eine systematische Übersicht. Aus der Biolog. Sungari River Station zu Harbin der Gesellschaft zur Erforschung der Mandschurei Bd. 1 Heft 2. Harbin.
- (1928): Die Euglenaceengattung *Phacus* DUJARDIN. Eine systematische Übersicht. Bericht. d. Deutsch. Botan. Gesellschaft Bd. 46 Heft 2. Berlin.

Explanation of plates.

Plates 9—12.

Plate 9.

- Fig. 1. *Euglena acus* EHR.
- Fig. 2. *Euglena acutissima* LEMM.
- Fig. 3. *Euglena oxyuris* SCHMARDA.
- Fig. 4. *Euglena spirogyra* EHR.
- Fig. 5. *Lepocinclis ovum* (EHR.) LEMM. var. *punctate-striata* LEMM.
- Figs. 6—8. *Lepocinclis indica* sp. nov.
- Fig. 9. *Lepocinclis fusiformis* (CARTER) LEMM.
- Figs. 10—12. *Lepocinclis Khannae* sp. nov.
- Fig. 13. *Phacus torta* (LEMM.) SKV.
- Fig. 14. *Phacus torta* (LEMM.) SKV. var. *tortuosa* SKV.
- Fig. 15. *Phacus longicauda* (EHR.) DUJ. var. *indica* var. nov.
- Fig. 16. *Phacus longicauda* (EHR.) DUJ. var. *insecta* KOCZWARA.
- Figs. 17, 18. *Phacus alata* KLEBS var. *indica* var. nov.
- Fig. 19. *Phacus Lemmermanni* (SWIR.) SKV.
- Figs. 20, 21. *Phacus brevicauda* (KLEBS) LEMM.
- Fig. 22. *Phacus pyrum* (EHR.) STEIN.
- Fig. 23. *Lepocinclis ovum* (EHR.) LEMM. var. *palatina* LEMM.

Plate 10.

- Fig. 1. *Phacus longicauda* (EHR.) DUJ. var. *indica* var. nov.
- Fig. 2. *Phacus longicauda* (EHR.) DUJ.
- Fig. 3. *Phacus pleuronectes* (O. F. M.) DUJ. var. *citriiformis* DREZ.
- Figs. 4, 5. *Phacus triquetra* (EHR.) DUJ.
- Fig. 6. *Phacus pekinensis* SKV. forma.
- Fig. 7. *Phacus setosa* FRANCE var. *crenata* SKV.
- Fig. 8. *Phacus oscillans* KLEBS.

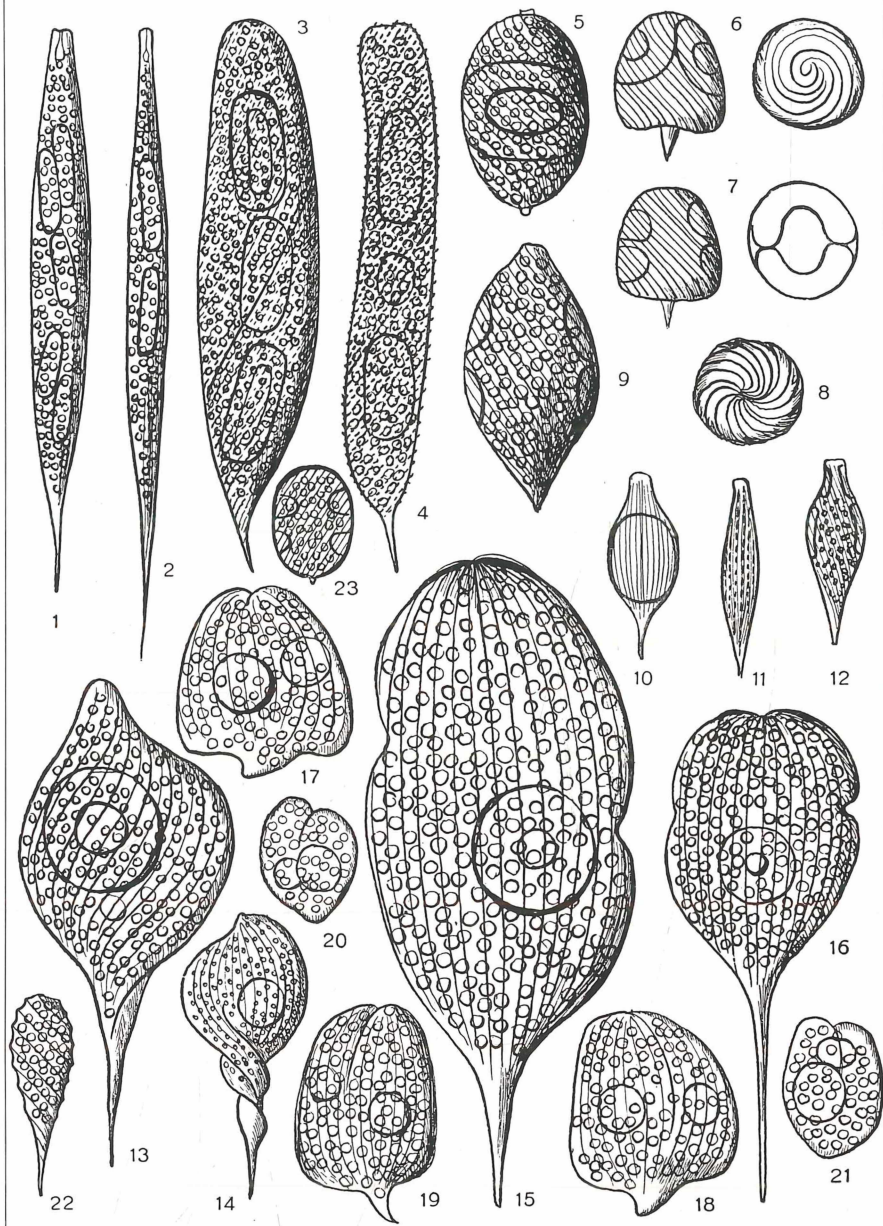
- Fig. 9. *Phacus indica* sp. nov.
 Fig. 10. *Trachelomonas volvocina* EHR.
 Fig. 11. *Trachelomonas volvocina* EHR. var. *derephora* CONRAD?
 Fig. 12. *Trachelomonas volvocina* EHR. var. *compressa* DREZ. emend. DEFL.
 Fig. 13. *Trachelomonas indica* sp. nov.
 Fig. 14. *Trachelomonas indica* sp. nov. var. *punctata* var. nov.
 Fig. 15. *Trachelomonas indica* sp. nov. var. *tubigena* var. nov.
 Fig. 16. *Trachelomonas indica* sp. nov. var. *Khannae* var. nov.
 Fig. 17. *Trachelomonas intermedia* DANG.
 Fig. 18. *Trachelomonas indica* sp. nov. var. *coronata* var. nov.
 Fig. 19. *Trachelomonas Richmondiae* (PLAYFAIR) DEFLANDRE var. *indica* var. nov.
 Fig. 20. *Trachelomonas subglobosa* SKV.
 Fig. 21. *Trachelomonas oblonga* LEMM.
 Fig. 22. *Trachelomonas Drezepolski* SKV. var. *indica* var. nov.
 Fig. 23. *Trachelomonas Drezepolski* SKV. var. *hispida* SKV.
 Figs. 24, 25. *Trachelomonas conica* PLAYFAIR var. *indica* var. nov.
 Fig. 26. *Trachelomonas Stokezi* DREZEP. emend. DEFLANDRE.
 Fig. 27. *Trachelomonas similis* STOKES var. *hyalina* var. nov.
 Fig. 28. *Trachelomonas paludosa* SKV.
 Fig. 29. *Trachelomonas Khannae* sp. nov.
 Fig. 30. *Trachelomonas similis* STOKES var. *indica* var. nov.

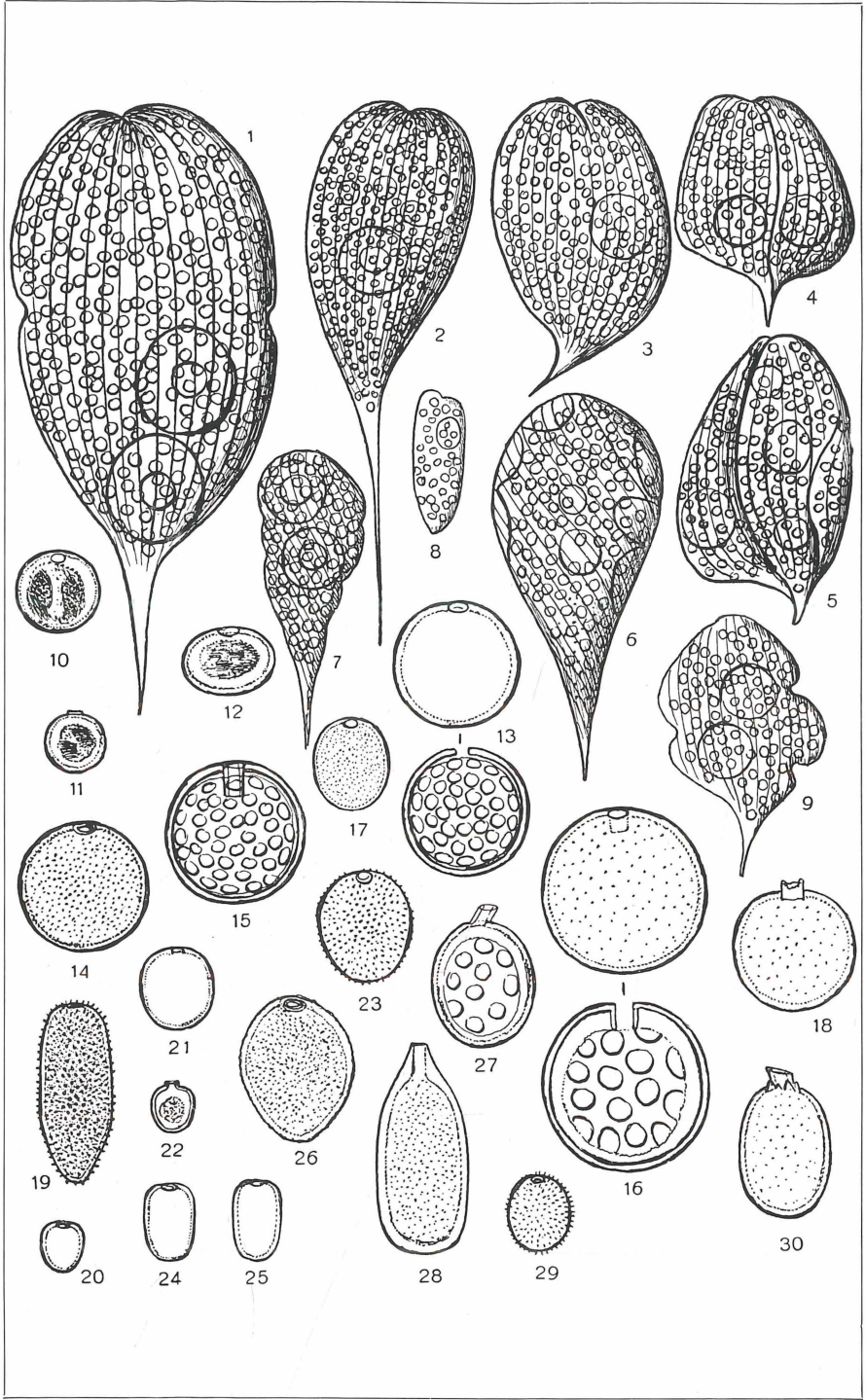
Plate 11.

- Figs. 1—3. *Trachelomonas superba* SWIR. emend. DEFLANDRE.
 Fig. 4. *Trachelomonas Kelloggii* SKV. var. *effigurata* SKV.
 Figs. 5, 6. *Trachelomonas Rangoonensis* sp. nov.
 Fig. 7. *Trachelomonas Rangoonensis* sp. nov. var. *curvata* var. nov.
 Fig. 8. *Trachelomonas hispida* (PERTY) STEIN.
 Figs. 9, 10. *Trachelomonas hispida* (PERTY) STEIN var. *coronata-punctata* var. nov.
 Fig. 11. *Trachelomonas armata* (EHR.) STEIN var. *indica* var. nov.
 Figs. 12—14. *Trachelomonas armata* (EHR.) STEIN var. *ovata* SWIR.
 Figs. 15, 16. *Trachelomonas cylindrica* EHR.
 Fig. 17. *Trachelomonas cylindrica* EHR. var. *punctata* SKV.
 Fig. 18. *Trachelomonas armata* (EHR.) STEIN var. *ovata* SWIR.
 Fig. 19. *Trachelomonas cylindrica* EHR. var. *punctata* SKV.
 Fig. 20. *Trachelomonas Kelloggii* SKV. var. *effigurata* SKV.
 Fig. 21. *Trachelomonas superba* SWIR. emend. DEFLANDRE.

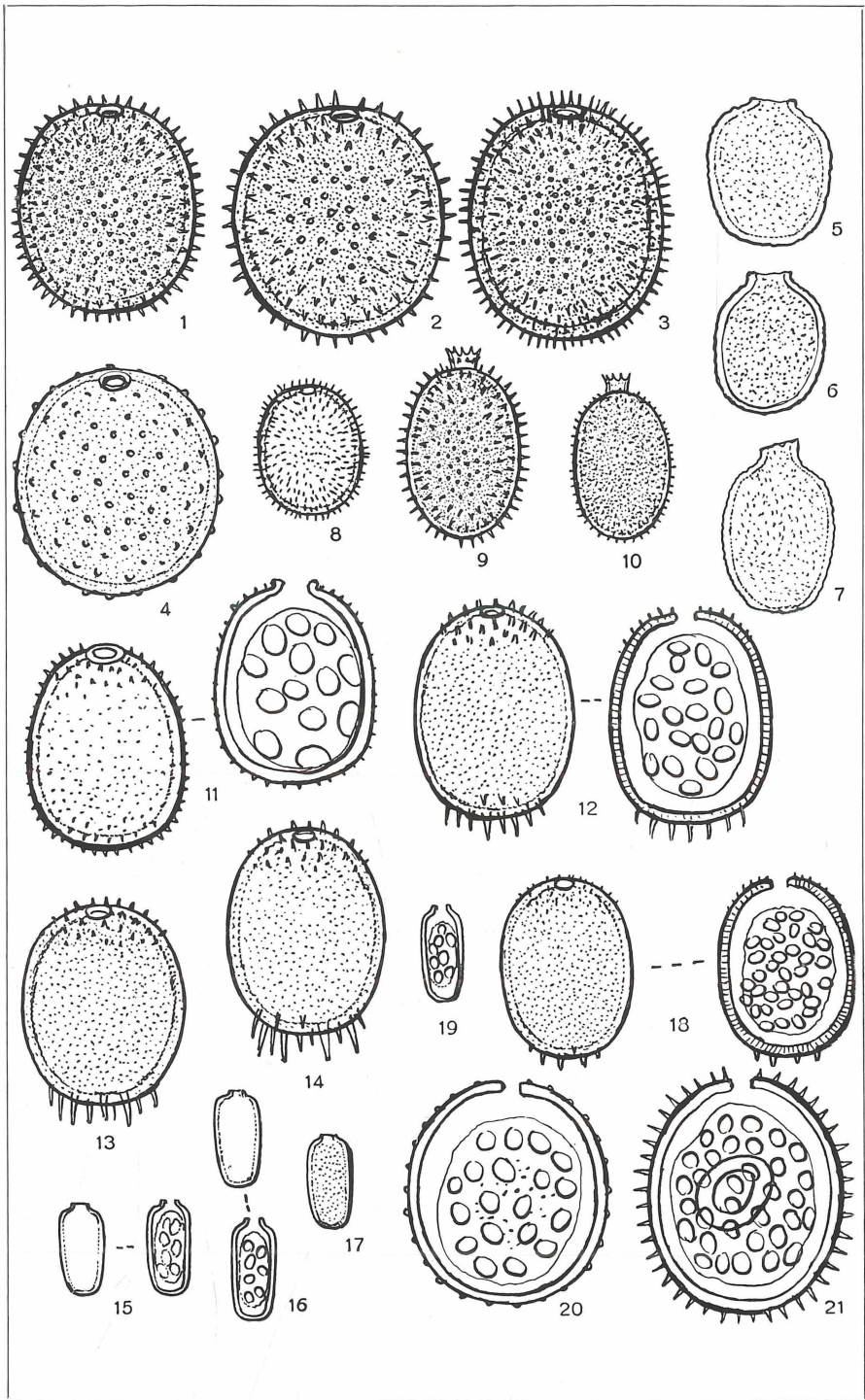
Plate 12.

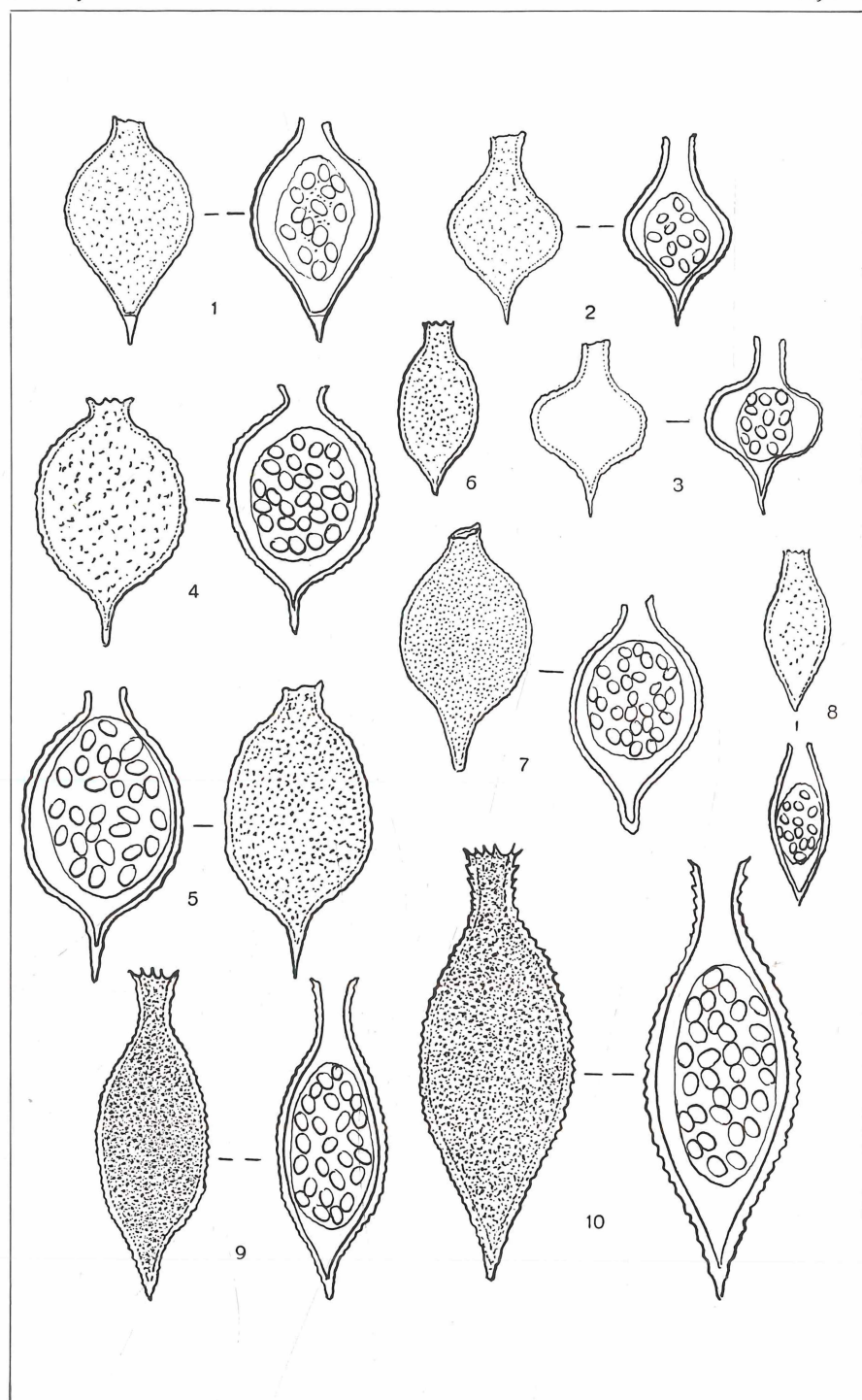
- Fig. 1. *Trachelomonas urceolata* STOKES var. *indica* var. nov.
 Figs. 2, 3. *Trachelomonas gibberosa* PLAYFAIR var. *indica* var. nov.
 Figs. 4, 5. *Trachelomonas zmiewika* SWIR.
 Fig. 6. *Trachelomonas Swirenko* SKV. var. *polonica* SKV.
 Fig. 7. *Trachelomonas zmiewika* SWIR.
 Fig. 8. *Trachelomonas fluviatilis* LEMM.
 Figs. 9, 10. *Trachelomonas Nadsonii* SKV. var. *indica* var. nov.





Skvortzov.





ZOBODAT - www.zobodat.at

Zoologisch-Botanische Datenbank/Zoological-Botanical Database

Digitale Literatur/Digital Literature

Zeitschrift/Journal: [Archiv für Protistenkunde](#)

Jahr/Year: 1938

Band/Volume: [90_1938](#)

Autor(en)/Author(s): Skvortzov B.V.

Artikel/Article: [Contributions to our knowledge of the Freshwater Algae of Rangoon, Burma, India. 69-87](#)