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ON SOME COLOURLESS FLAGELLATES FROM JAVA AND BRASIL

B. V. SKVORTZOV
Instituto de Botanica, Sao Paulo, Brasil

ABSTRACT

Two new monotypic genera (*Kizakimonas bogoriensis* and *Hoehnemastix saopaulensis*) and six other new species (four in *Tetramitus* and two in *Balliamonas*) of colourless flagellates are described based on samples collected in Bogor and Sao Paulo.

ABSTRAK

Dua marga monotipe (*Kizakimonas bogoriensis* dan *Hochnemastix saopaulensis*) dan enam jenis (empat dalam *Tetramitus* — antara lain *Tetramitus indonesiae* — dan dua dalam *Balliamonas*) flagellata tak berwarna telah dipertelakan untuk pertama kali berdasarkan contoh-contoh yang dikumpulkan di Bogor (Jawa) dan Sao Paulo (Brasilia).

The colourless flagellates described in the present note have been cultivated and studied in the Instituto de Botanica, Sao Paulo. They were isolated from samples collected by Dr. M. Kizaki in Bogor (Java) in 1971 and by the present author in Sao Paulo, Brasil. All illustrations presented were made from living specimens and all type specimens studied are preserved in the Cryptogamic Herbarium of the Instituto de Botanica, Sao Paulo, Brasil.

The eight species described are distributed among four genera which can be distinguished as follows.

1. Cells 3 times broader than its length, with 2 swimming flagelles. *Kizakimonas* gen. nov.
2. Cells fusiform, with 2 anterior and one posterior flagelles. *Balliamonas* Skvortzov
3. Cells elongate to fusiform, with 3 anterior flagelles of different length. *Hoehnemastix* gen. nov.
4. Cells elongate ovate to fusiform, with 4 anterior flagelles of different sizes. *Tetramitus* Perty

Kizakimonas Skvortzov, *gen. nov.*

Fam. Amphimonadaceae, Ord. Protomastiginae.

Monada solitaria, libere natantes, compresso-lanceolata, cum antico et postico oppositis convexis, 3 plo latius quam longius; membrana

tenuissima, undulata et metabolica; cytoplasma granulis minutis impleta; vacuolis contractilis lateralis; nucleus indistinctus; flagellis 2 in una latere in distantes majoris positis, equilongae, cellulae longiora et natantes.

Genus dedicavi in honorem Dr. M. Kizaki.

TYPUS: *Kizakimonas bogoriensis* Skvortzov.

Kizakimonas bogoriensis Skvortzov, *spec. nov.* — Fig. 6

Cellula 9—10 μm longa.

Hab. in cultura *Hydrilla* sp., prope Bogor (Java), 16.11.1971, *M. Kizaki*

Hoehnemastix Skvortzov, *gen. nov.*

Fam. Tetramitaceae, Ord. Protomastiginae.

Monada solitaria, libere natantes, non applanata, asymmetrica, brevi-fusiformis cum apicibus subacutis, leteribus constrictis vel undulatis; periplasto tenuissima et metabolica; cytoplasma hyalina, granulis coeruleis et vacuolis ad nutrimentum impleta; vacuolis contractilis minor; nucleus fete medianum; flagelli 3 apicale, duas brevior fere 2/3 cellulae longior, una multo longior; motio rotante rapide.

Dedicavi hanc generis in memoriam Dom. Dr. F. C. Hoehne (Dir. Horto Botanico, Sao Paulo).

TYPUS: *Hoehnemastix saopaulensis* Skvortzov.

Hoehnemastix saopaulensis Skvortzov, *spec. nov.* — Fig. 5

Cellula 8–9 μm longa.

Hab. inter *Spirogyra* sp. terrestris in aqua fontinalis montanis, prope Parque do Estado do Sao Paulo, 22.3.1968, *B. Skvortzov.*

TETRAMITUS Perty

Fam. Tetramitaceae, Ord. Protomastiginae.

Monada single, swimming, slightly metabolic, asymmetrical, elongate ovate or long obovate with a longitudinal furrow or with a furrow in ventral side of the cell, or with constricted, ventral side; 4 flagelles on the anterior part of the cell of different sizes, 3 of which are short and swimming, and one longer and trailing; one contractile vacuole almost on anterior part of the cell and numerous nutritive vacuoles in the middle of posterior end; nucleus or kinetonucleus distinct or indistinct; cells division in motile state; cysts not seen; nutrition saprophytic and holozoic; swimming forward, fast.

DISTRIBUTION: Reported from polluted waters and probably of cosmopolitan in distribution, with 4 species known from Europe. In the present report 4 more different species are given, 3 recorded from subtropics of Brasil and one from Indonesia.

KEY TO SPECIES DESCRIBED

1. Cells ovate with attenuate anterior end, broad rounded or truncate rounded in posterior end.
   a. Cells elongate ovate with subacute or elongate, subcapitate anterior part in metaboly sometimes with constricted anterior part; contractile vacuole near the middle part of the cell. *T. terrestris*
   b. Cells elongate ovate to almost subcylindrical or in metaboly quadrangular or trapezoid; contractile vacuole apical and distinct. *T. brasilianus*
2. Cells asymmetrical or symmetrical obovate to long fusiform; anterior end rounded or acute, posterior end long or shortly acute.
   a. Cells obovate, almost symmetrical with both short acute ends; contractile vacuole anterior, large and distinct. *T. serrademar*
   b. Cells obovate to fusiform symmetrical or strong asymmetrical; anterior end rounded or short acute, posterior long acute; contractile vacuole posterior. *T. indonesiae*

Tetramitus terrestris Skvortzov, *spec. nov.* — Fig. 1

Monada natantes elongato-ovata vel lagenarieformis cum lateribus constrictis; parte anteriore gradatim attenuato, subacutis vel rotundatis, parte posteriori rotundatis; membrana tenuissima et metabolica; cytoplasma hyalina; vacuola contractilis fere mediana vel supra mediana vel supra mediana parte posteriori; nucleus indistinctus; vacuolis ad nutrimentum adsunt, flagella 4, apicale, 3 natantes 2/3 cellulae longitudine pro longiore; flagellum trachendi 1, fere cellula longiori; motio rotante. Cellula 14—20 μm longa.

Hab. in *Spirogyra* sp. on surface of soil near the lake of a steel factory near Parque do Estado do Sao Paulo, 22.3.1968, *B. Skvortzov.*

Tetramitus brasilianus Skvortzov, *spec. nov.* — Fig. 2

Monada asymmetrica ovata vel elongato-ovata vel fere cylindrica, cum parte anteriore brevi acutis vel attenuatis et rotundatis vel abruptis, parte posteriori rotundata vel truncato-triquetris; membrana forti metabolica; cytoplasma cum vacuolis ad nutrimentum impleto; vacuola contractilis apicale; flagella 4, 3 natantes una tranchendi cellula longiora; motio rotante; nucleus medianus; cellula 25—30 μm longa.

Hab. in culture of *Utricularia* sp. collected in a mountain swamp, Parque do Estado do Sao Paulo, 11.3.1966, *B. Skvortzov.*

Tetramitus serrademar Skvortzov, *spec. nov.* — Fig. 3

Monada obovata cum apicibus brevi attenuatis et subacutis; membrana tenuissima, minute metabolica cytoplasma hyalina; vacuola contractilis prope apicem, vacuolis ad nutrimentum supra medianae; flagella 4, natantes 3 fere cellulae longiora, flagellum trachendi 1 cellulae longiora; cellula 12—15 μm longa.

Hab. in terra, Serra de Mar (Brasil), 30.7.1965, *B. Skvortzov.*

Tetramitus indonesiae Skvortzov, *spec. nov.* — Fig. 4

Monada obovata vel fusiformis, asymmetrica cum parte dorsalis et ventralis; membrana tenuissima, indistincte metabolicae; cytoplasma hyalina; nucleus (kinetonucleus) parte anteriore; vacuolis contractilis mediana vel posterior: flagella 4, natantes flagella 3, trachendi 1 multo longior; cellula 7.4—12 (18) μm longa.

Hab. in *Pistia* sp., Bogor (Java, Indonesia), 8.11.1971, *M. Kizaki.*

BALLIAMONAS Skvortzov

Balliamonas Skvortzov *in* Ceylon Journ. Sc. 6(2): 219.1967.

Fam. Distomataceae, Ord. Distomatinae.

Monada single, swimming, not metabolic, asymmetrical, not depressed or depressed, obovate or fusiform; flagelles 3, in anterior end of the cell, 2 swimming flagelles, about ½ of the cell length; trailing flagellum ⅓—½ of the cell length; the aplanate form from front view in the lower part with a furrow, from the lateral view long fusiform and twisted; cell inside with or without a contractile vacuole; nutrition vacuoles present; movements forwards turning around of the longitudinal axis.

TYPE SPECIES: *Balliamonas spiralis* Skvortzov.

KEY TO SPECIES

1. Cells not depressed.
   a. Cells elongate fusiform with more or less rounded anterior end; twisted cells have from one side an undulation; contractile vacuole not seen; cells 8—9 × 2—2 μm. *B. spiralis* (Fig. 9)
   b. Cells short fusiform, anterior end subacute or acute, posterior acute; contractile vacuole in anterior part. *B. riobonito*
2. Cells depressed and twisted, 15—18 μm long; some cells in the lower part with a furrow. *B. brasiliana*

Balliamonas riobonito Skvortzov, *spec. nov.* — Fig. 8

Monada asymmetrica, fusiformis cum parte dorsalis modice undulatis vel rotundatis, ventrale recta vel modice rotundatis, latiore in parte anteriore obliquae cum latere acutis, parte posteriori elongata et modice curvata; periplasto tenuissimo et non metabolica; vacuola contractilis parte anteriore; nucleus fere medianus; vacuolis ad nutrimentum adsunt; cellula 10—15 μm longa.

Hab. inter plantis aquaticis, prope Rio Bonito, Sao Paulo, 26.6.1963, *B. Skvortzov.*

Balliamonas brasiliana Skvortzov, *spec. nov.* — Fig. 7

Monada solitaria, libere natantes, applanata, spiraliter fusiformis, anteriore brevi acutis, posteriore gradatim attenuata; membrana tenuissima et non metabolica; cytoplasma minute granulata et cum vacuolis

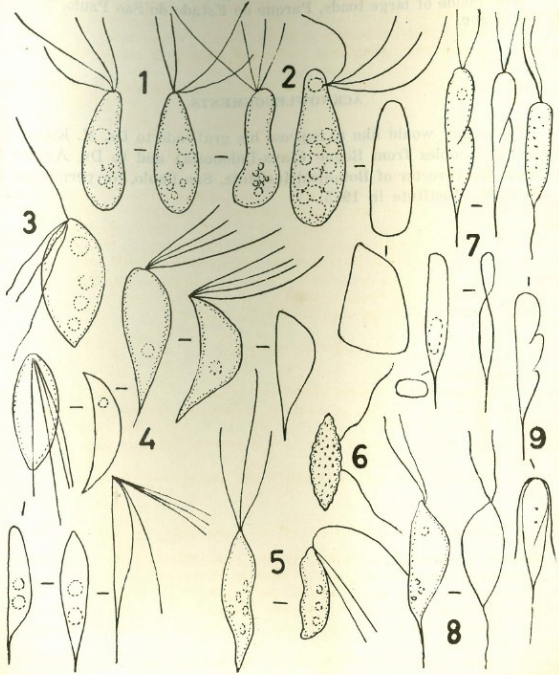

Fig. 1-9. 1. *Tetramitus terrestris.* 2. *Tetramitus brasilianus.* 3. *Tetramitus serrademar.* 4. *Tetramitus indonesiae.* 5. *Hoehnemastix saopaulensis.* 6. *Kizakimonas bogoriensis.* 7. *Balliamonas brasiliana.* 8. *Balliamonas riobonito.* 9. *Balliamonas spiralis.*

contractilis impleta; cellula fronte visa spiraliter curvata; vacuolis ad nutrimentum adsunt; cellula 15–18 um longa; motio circumvertio, rapide.

Hab. inside of large toads, Parque do Estado do Sao Paulo, 3.1.1963, *B. Skvortzov.*

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