

FAUNA OF INDIA CHECKLIST

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PROTOZOA: EXCAVATA: EUGLENOZOA, Cavalier-Smith, 1981

Patatri Sarkar^{1,3} & Jasmine Purushothaman^{1,2*}

¹HQ, Zoological Survey of India, New Alipore, Kolkata, West Bengal 700053, ²jasbose@gmail.com; <https://orcid.org/0000-0002-3980-4474>, ³patatri.89@gmail.com, *Corresponding author: jasbose@gmail.com

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zsifaunachecklists@gmail.com
and jasbose@gmail.com



ZOOLOGICAL SURVEY OF INDIA
Ministry of Environment, Forest & Climate Change

PROTOZOA: EXCAVATA: EUGLENOZOA, Cavalier-Smith, 1981

Patatri Sarkar^{1,3} & Jasmine Purushothaman^{1,2*}

¹HQ, Zoological Survey of India, New Alipore, Kolkata, West Bengal 700053, ²jasbose@gmail.com; <https://orcid.org/0000-0002-3980-4474>, ³patatri.89@gmail.com, *Corresponding author: jasbose@gmail.com

Introduction: Euglenozoa are a vital subclass of flagellate Discoba. They contain a number of well-known species that live freely alongside a few substantial parasites, several of which can infect humans. Euglenozoa can be classified into four major groups: kinetoplastea, diplomonada, euglenida, and symbiontida. Euglenozoa are unicellular organisms that normally have sizes between 15 and 40 μ m (0.00059 to 0.00157 in), while some euglenids can reach lengths of up to 500 μ m (0.020 in). The majority Euglenozoa have two flagella, which are parallel to each other and inserted within an apical or subapical compartment. Some of these have a cytostome or mouth that can devour bacteria or other microscopic animals. The cell's rear and frontal surfaces are supported by the other two of all three sets of microtubules which protrude from the flagellar bases. Euglenids are the sole eukaryotes outside of Diaphoretickes to have chloroplasts without undergoing kleptoplasty, allowing them to use photosynthesis to obtain energy. Other euglenozoa obtain their food through absorption. These three membrane-enclosed chloroplasts, which also contain the pigments chlorophylls A and B, are most likely ancestors of the green alga that was long ago snatched up by a primitive euglenozoan in an endosymbiosis. The only process that reproduces is dividing cells. Throughout mitosis, the spindle microtubules grow inside the intact nuclear membrane.

Global diversity: Phylum Euglenozoa comprises of 122 genera and 18 families, totalling 2100 species as this phylum has its existence since the Cenomanian period.

Diversity in India: In India, total 88 species belonging to 7 genera and 3 families have been recorded.

Diversity in States (Table)

Sl.No.	State/Union Territory	No. Species	No. Endemic Species
1	Andhra Pradesh	6	
2	Arunachal Pradesh	1	
3	Assam	2	
4	Bihar	5	
5	Chhattisgarh	4	
6	Gujarat	2	
7	Goa	1	
8	Haryana	1	
9	Himachal Pradesh	1	
10	Jharkhand	2	
11	Karnataka	3	
12	Kerala	2	

Sl.No.	State/Union Territory	No. Species	No. Endemic Species	
13	Madhya Pradesh	3	NA	
14	Maharashtra	5		
15	Manipur	1		
16	Meghalaya	1		
17	Mizoram	1		
18	Nagaland	1		
19	Odisha	3		
20	Punjab	2		
21	Rajasthan	2		
22	Sikkim	1		
23	Tamil Nadu	2		
24	Telangana	4		
25	Tripura	2		
26	Uttar Pradesh	7		
27	Uttarakhand	1		
28	West Bengal	9		
29	Andaman & Nicobar	1		
30	Chandigarh	2		
31	Dadra Nagar Haveli, Daman & Diu	1		
32	Delhi	5		
33	Jammu & Kashmir	1		
34	Ladakh	1		
35	Lakshadweep	1		
36	Puducherry	1		
	INDIA TOTAL	88		0

Endemism: No species of the phylum Euglenozoa are endemic to India.

Habitat: Flagellated protists belonging to phylum Euglenozoa include free-living, symbiotic, and parasitic species. While many of the group's members are widely found bacteriotrophs in freshwater and marine habitats, many others, like *Euglena* sp., are photosynthetic autotrophs.

Ecological Significance: *Euglena* sp. can be important component of some aquatic environments as a primary producer that is consumed by other species as well as decomposers that consumes other creatures. Phylum Euglenozoa can play important ecological functions in aquatic creatures' food chain. In addition to serving as host regulators, parasites are crucial to the food chain.

Human Significance: The parasites of the phylum Euglenozoa have been associated with parasitic diseases in terrestrial and aquatic animals, particularly fishes, which can be detrimental from an economic standpoint.

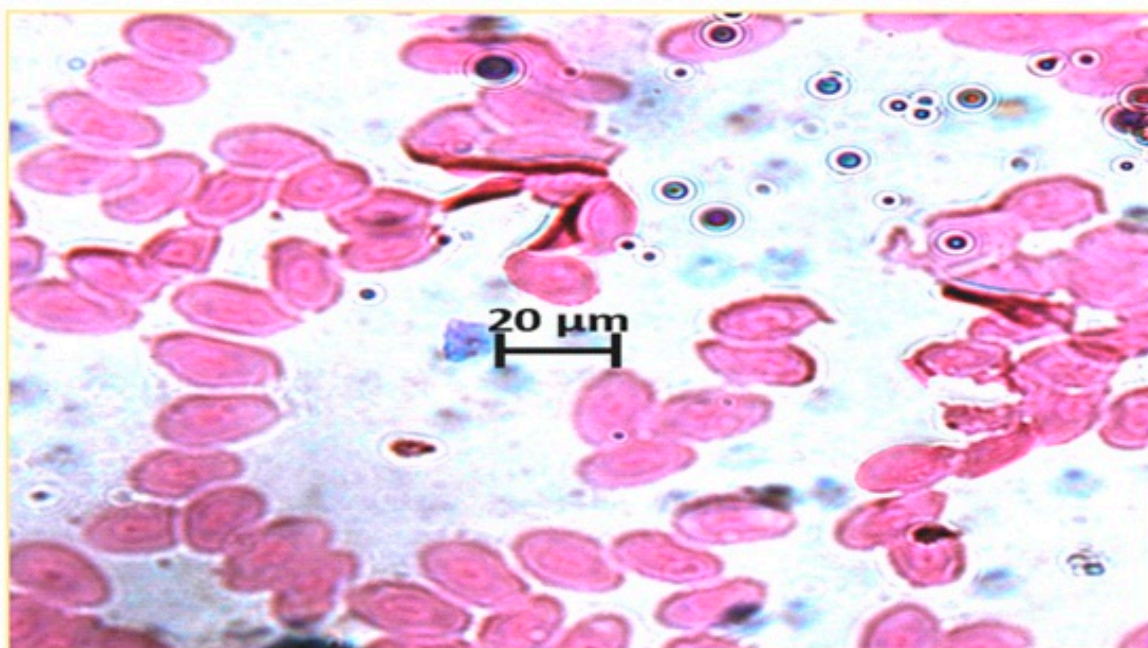
Threatened species: Species of the phylum Euglenozoa from India are not assessed for IUCN threat categories.

Protected Species as per WPA (2022): Species of the phylum Euglenozoa are not listed under any schedules of Wildlife Protection Act (2022).

Species under CITES: Species of the phylum Euglenozoa are not listed under any appendices of CITES.

Invasive alien species: No Euglenozoa species are reported to be invasive in India.

Gap areas: There aren't many phylum Euglenozoa studies done in India. It is essential to perform a thorough study of phylum Euglenozoa in order to fully understand the diversity of the phylum in India.



Trypanosoma rotatorium Mayer, 1843 from host *Bufo* sp. Garsault, 1764

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- Cavalier-Smith, T. (2016). Higher classification and phylogeny of Euglenozoa. *European Journal of Protistology*, 56: 250-276.

Sl. No.	Species
	Phylum EUGLENOZOA
	Class KINETOPLASTEA
	Order TRYPANOSOMATIDA
	Family TRYPANOSOMATIDAE
	Genus <i>Trypanosoma</i>
1	<i>Trypanosoma tengari</i> n. sp. (Gruby, 1843)
2	<i>Trypanosoma rotatorium</i> (Mayer, 1843)
3	<i>Trypanosoma lewsi</i> Kent
4	<i>Trypanosoma avium</i>
5	<i>Trypanosoma</i> sp.
6	<i>Trypanosoma delhiense</i>
7	<i>Trypanosoma batrachi</i> Quadri
8	<i>Trypanosoma striati</i> Quadri
9	<i>Trypanosoma pancali</i> Mandal
10	<i>Trypanosoma channai</i> Narasimhamurti and Saratchandra, 1980
11	<i>Trypanosoma godavariensis</i> Saratchandra and Jayaramaraju, 1981
12	<i>Trypanosoma lissemysi</i> Saratchandra, 1980
13	<i>Trypanosoma bandicotti</i> Lingard, 1904
14	<i>Trypanosoma indicum</i> Luhe, 1906
15	<i>Trypanosoma evansi</i> (Steel, 1885)
16	<i>Trypanosoma theileri</i> Laveran, 1902
17	<i>Trypanosoma chattoni</i> Mathis & Liger
18	<i>Trypanosoma evansi</i> (Steel, 1885)
19	<i>Trypanosoma gambiense</i>
20	<i>Trypanosoma rangeli</i>
21	<i>Trypanosoma armeti</i> Mondal
22	<i>Trypanosoma striata</i> Qadri
23	<i>Trypanosoma granulosum</i> Laveran & Mesnil, 1902
24	<i>Trypanosoma cancili</i> Mandal
25	<i>Trypanosoma lewisi</i> (KENT)
26	<i>Trypanosoma enhydris</i> Sinha & Mandal
27	<i>Trypanosoma bengalensis</i>
28	<i>Trypanosoma choudhuryi</i> Mandal
29	<i>Trypanosoma tandoni</i> Mandol
30	<i>Trypanosoma taprobanica</i> Ray & Choudhury
31	<i>Trypanosoma systema</i> Ray & Choudhury
32	<i>Trypanosoma loricatum</i> (MAYOR)
33	<i>Trypanosoma karyozeukton</i> (DUTTON & TODD)
34	<i>Trypanosoma malabarica</i> Ray & Choudhury
35	<i>Trypanosoma rhinopome</i> (BANDYOPADHYAY, RAY & DASGUPTA)
36	<i>Trypanosoma</i> (GOBIDA MANDAL)
37	<i>Trypanosoma rhodesiense</i>

Sl. No.	Species
38	<i>Trypanosoma cruzi</i>
39	<i>Trypanosoma brucei</i>
40	<i>Trypanosoma neveulemairei</i> Brumpt
41	<i>Trypanosoma lucknowi</i> Weinman et. al
42	<i>Trypanosoma conorrhini</i> (Denovan) Shortt and Swaminath
43	<i>Trypanosoma cyclops</i> Weinman
44	<i>Trypanosoma</i> (GOBIDA MANDAL)
45	<i>Trypanosoma brucei brucei</i>
46	<i>Trypanosoma enhydris</i> Sinha & Mandal
47	<i>Trypanosoma granulosum</i> Laveran & Mesnil, 1902
48	<i>Trypanosoma chattoni</i> Mathis & Zeger
49	<i>Trypanosoma armeti</i> Mondal
50	<i>Trypanosoma inopinatum</i> Sergent & Sergent
51	<i>Trypanosoma mega</i> Dutton and Todd
52	<i>Trypanosoma balithaensis</i> Ray
53	<i>Trypanosoma rhinolophonis</i> Pal and Dasgupta
	Genus Leptomonas
54	<i>Leptomonas bakeri</i> Prasad and Kalavati, 1987
55	<i>Leptomonas indica</i> Prasad and Kalavati, 1987
56	<i>Leptomonas colosoma</i>
	Genus Leishmania
57	<i>Leishmania tropica</i> (Ross 1903)
58	<i>Leishmania chagasi</i> (Ross 1903)
59	<i>Leishmania mazor</i> (Yakimoff and Schokhor) Bray et.al
60	<i>Leishmania donovani</i> (Laveren and Mesnil) Ross
61	<i>Leishmania tarentolae</i> (Ross 1903)
62	<i>Leishmania mexicana</i> (Ross 1903)
63	<i>Leishmania adleri</i> (Ross 1903)
64	<i>Leishmania donovani donovani</i> (Ross 1903)
65	<i>Leishmania infantum</i> Nicolle
66	<i>Leishmania mexicana</i> (Baigi) Granham
	Genus Bodomonas
67	<i>Bodomonas rebae</i> Tripathi
	Order PROKINETOPLASTIDA
	Family ICHTHYOBODONIDAE
	Genus Ichthyobodo
68	<i>Ichthyobodo sp.</i> Pinto, 1928
	Order EUBODONIDA
	Family CRYPTOBIACEAE
	Genus Trypanoplasma
69	<i>Trypanoplasma indica</i> (Mandal)
70	<i>Trypanoplasma gupti</i> Gupta and Gupta 1987

Sl. No.	Species
71	<i>Trypanoplasma jayasriparvateesami</i> nov. comb. (Syn. <i>Cryptobia indica</i>) Jayasri and Parvateesam, 1982)
72	<i>Trypanoplasma krishnamurthyi</i> Wahul, 1985
73	<i>Trypanoplasma lomi</i> Wahul, 1986
74	<i>Trypanoplasma maguri</i> Gupta and Gupta 1987
75	<i>Trypanoplasma mysti</i> Joshi 1982
76	<i>Trypanoplasma ompoki</i> Shavanas et. al 1989
77	<i>Trypanoplasma parastomataei</i> Narasimhamurti et. al 1990
78	<i>Trypanoplasma qadrui</i> Krishnamurthy and Wahul, 1986
79	<i>Trypanoplasma saranae</i> Wahul, 1986
80	<i>Trypanoplasma seenghali</i> Wahul, 1985
81	<i>Trypanoplasma solapurensis</i> Wahul, 1986
82	<i>Trypanoplasma tengari</i> Gupta et al., 1988
83	<i>Trypanoplasma vidyai</i> Wahul, 1985
84	<i>Trypanoplasma wallagoi</i> Wahul
85	<i>Trypanoplasma</i> sp.
	Class EUGLENOIDEA
	Order EUGLENALES
	Family EUGLENACEAE
	Genus <i>Euglena</i> EHRENBERG, 1830
86	<i>Euglena viridis</i>
87	<i>Euglena gracilis</i>
88	<i>Euglena sanguinea</i>