

## First report of freshwater leech *Helobdella stagnalis* (Rhyncobdellida: Glossiphoniidae) as a parasite of an anuran amphibian

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**Abstract.** The authors describe the first case of parasitism on anuran amphibian, *Rana temporaria*, by the freshwater leech *Helobdella stagnalis*, in a mountainous area of northwestern Italy. The presence of skin abrasions and haemorrhages attributable to leech attack discards the hypothesis of a simple phoretic relationship between leech and frog.

**Keywords.** *Helobdella stagnalis*, leech, parasite, anuran, *Rana temporaria*.

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*Helobdella stagnalis* (Linnaeus, 1758) is an aquatic predator which preferentially feed on immature stages of freshwater arthropods, annelids and snails (Sawyer, 1986). Even if it has been reported as an occasional parasite of poikilothermic vertebrates (Malek and McCallister, 1984), there are few data supporting this contention: reports of *H. stagnalis* as a parasite of fish are rare (Mishra and Chubb, 1969; Malek and McCallister, 1984) and Walton (1964) did not include *H. stagnalis* in the summary of host-parasite associations involving amphibians. The only description of *H. stagnalis* as an amphibian parasite dates back to '90s, when it was found from an urodele host, the tiger salamander (*Ambystoma tigrinum*) from a population of Indiana (U.S.A.) (Platt et al., 1993); as a matter of fact, Minelli (1977) described *H. stagnalis* as an occasional parasite of amphibian, but he did not support this assertion with any reference or observed data.

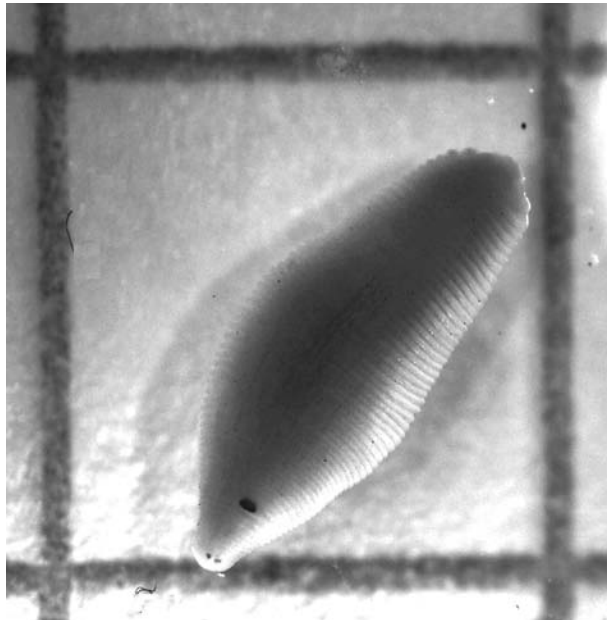
This paper describes the second report of *H. stagnalis* from an amphibian host and the first from an anuran host: the common frog (*Rana temporaria*), from mountain ponds in Northern Italy.

Frogs were collected in May, 2005, from three permanent pastureland ponds filled by melting snow and rain (Table 1). The ponds lie on a mountain pastureland in Mount Guglielmo massif (Southern Italian Alps – Valtrompia – municipality of Pezzaze) (Table 1).

Frogs were collected in water during the breeding season: just one parasited frog was collected for anatomopathological analysis and delivered alive to the IZS (Istituto Zoopro-

**Table 1.** Main geographical and morphological data of POND-1, POND-2 and POND-3; A: area; D: maximum depth.

	Lat.	Long.	Alt. (m a.s.l.)	A (m <sup>2</sup> )	D (m)
POND-1	45°45'43" N	10°11'59" E	1373	1125	1,1
POND-2	45°45'35" N	10°11'56" E	1408	890	1,7
POND-3	45°45'59" N	10°11'85" E	1321	485	0,6



**Fig. 1.** *Helobdella stagnalis* from an anuran host on a 5 mm grid.

filattico Sperimentale) of Brescia; 14 other individuals were captured, observed and immediately released.

Leeches have been kept in 70° ethanol and readily identified as *H. stagnalis* thanks to the presence of a chitinized nuchal scute, which is characteristic of this species (Sawyer, 1986) (Fig. 1).

A summary of the observations on collected frogs is presented in Table 2.

Frog 1 (Table 2) was the only collected frog: it was under a strong leech attack and it showed several dark globular clusters under the skin and in the foot webs; laboratory analysis confirmed the presence of *H. stagnalis* and reported the presence of skin abrasions and haemorrhages attributable to leech presence. The dark globular clusters were identified as melanophore accumulations coupled with local dermic inflammation. This kind of hyperplasia, or cell proliferation, is usually a non-specific finding and can occur at sites of previous cutaneous injury or infection (Pessier, 2007); for this reason we suggest a causal relationship between leech attack and melanophore globular clusters. In the

**Table 2.** Summary of the observations on frogs collected in Mount Guglielmo Area.

Pond	Date	<i>H. stagnalis</i> presence
Frog 1	2 May 5 <sup>th</sup> , 2005	Y Some tens of parasites on belly, throat, anterior and posterior legs; presence of dark globular clusters
Frog 2	2 May 5 <sup>th</sup> , 2005	Y Some tens of parasites on belly, throat, anterior and posterior legs.
Frog 3	2 May 5 <sup>th</sup> , 2005	Y Some tens of parasites on belly, throat, anterior and posterior legs.
Frog 4	3 May 5 <sup>th</sup> , 2005	Y Less than ten parasites on belly and posterior legs
Frog 5	1 May 5 <sup>th</sup> , 2005	Y Some tens of parasites on belly, throat, anterior and posterior legs.
Frog 6	1 May 5 <sup>th</sup> , 2005	Y Some tens of parasites on belly, throat, anterior and posterior legs.
Frog 7	1 May 5 <sup>th</sup> , 2005	N Absence of parasites
Frog 8	1 May 5 <sup>th</sup> , 2005	N Absence of parasites
Frog 9	1 May 5 <sup>th</sup> , 2005	N Absence of parasites
Frog 10	3 May 25 <sup>th</sup> , 2005	N Absence of parasites; presence of dark globular clusters
Frog 11	3 May 25 <sup>th</sup> , 2005	N Absence of parasites; presence of dark globular clusters
Frog 12	3 May 25 <sup>th</sup> , 2005	N Absence of parasites; presence of dark globular clusters
Frog 13	3 May 25 <sup>th</sup> , 2005	N Absence of parasites; presence of dark globular clusters
Frog 14	3 May 25 <sup>th</sup> , 2005	N Absence of parasites
Frog 15	2 May 25 <sup>th</sup> , 2005	Y Just one parasite on the posterior legs

former observation of leeches parasitism on *A. tigrinum* (Platt et al., 1993) skin abrasions were absent as well as melanophore accumulations. Therefore, our observations demonstrate without doubt an actual parasitism from leech on *R. temporaria* and not only a simple phoretic relationship between leech and frogs. Moreover, on the 25<sup>th</sup> of May, the latest part of breeding period, the observed frogs were almost not interested by the presence of leeches, but they still showed melanophore accumulations (Table 2). We consider the melanophores accumulations as a mark of previous leech attack and the observed lack of *H. stagnalis* as a consequence of more terrestrial habits in post breeding frogs.

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