

OVERVIEW OF POSSIBLE SIMULIIDAE RELATED PROBLEMS IN THE ALESSANDRIA DISTRICT (PIEDMONT, ITALY)

ASGHAR TALBALAGHI¹, MASSIMO PESSINO², PAOLO AGOSTA¹, TIZIANO BO²,
AND ALEKSANDRA IGNJATOVIĆ-ČUPINA³

¹ Mosquito Control Operations, University of Eastern Piedmont, Spalto Marengo 33,
15100 Alessandria, Italy

² Department of Life and Environmental Sciences (DISAV), University of Eastern Piedmont,
Via Bellini 25, 15100 Alessandria, Italy

³ Faculty of Agriculture, Institute of Environment and Plant Protection,
Trg Đositeja Obradovića 8, 21000 Novi Sad, Serbia

ABSTRACT – In Italy, some cases of massive attack by blackflies (*reptans* group) to both cattle and humans occurred in subalpine and alpine valleys of Lombardia, Trentino, and Veneto (ZANIN & RIVOSECCHI, 1975; RIVOSECCHI & COLUZZI, 1962), resulting in several animal deaths. In Marches (Central Italy), *Simulium intermedium* attacked humans (RIVOSECCHI, 1997).

In the present study, we provide an initial evaluation of the possibilities of blackfly attacks in the Alessandria Province (eastern part of the Piedmont region, NW Italy), where the Simuliidae fauna is still mostly unknown. This evaluation is based on the results of investigating a wide selection of streams of different ranks in the Scrivia, Borbera, Lemme, Bormida and Belbo catchments for the presence of larvae, pupae, and adults.

KEY WORDS: Simuliidae, blackflies, checklist, parasitology, Alessandria, Piedmont, Italy

INTRODUCTION

In Italy, blackflies have been studied mainly in areas where their presence resulted in cases of massive attack on cattle and humans and where they usually bite people who live near lowland streams. RIVOSECCHI (1978) gave an extensive list of Simuliidae that bite mammals, humans, and birds. He also observed that blackflies do not have a strictly specialized diet; instead, every blood-

feeding species bites cattle, sheep, goats, humans and so on. Some cases of massive attack on both cattle and humans occurred in subalpine and alpine valleys of Lombardia, Trentino, and Veneto (ZANIN & RIVOSECCHI, 1975; RIVOSECCHI & COLUZZI, 1962), resulting in several animal deaths. In Marche (Central Italy) *Simulium intermedium* attacked humans (RIVOSECCHI, 1997).

A wide study was carried out by GHETTI ET AL., (1999) in northeast Italy (Friuli Venezia Giulia), where people living near the channels of some lowland streams were bitten. Those channels were colonized by *S. ornatum*, *S. paraequinum*, *S. erythrocephalum*, *S. angustitarse*, and *S. equinum*.

On the territory of the Alessandria Province (NW Italy), taxonomical composition of the blackfly community was mostly unknown. Only a recent study carried out by TALBALAGHI ET AL., (2004) contained a first list of species found in some streams there.

AIM OF STUDY

This study provides a preliminary evaluation of the species composition of blackflies in the Alessandria Province (Piedmont, NW Italy; Fig. 1), extending the previous list (TALBALAGHI ET AL., 2004).

In the present work, we sampled larvae and pupae in streams and rivers of different ranks, choosing sampling stations near towns and cities, in the vicinity of cattle breeding sites, and in some completely unpolluted and unsettled areas. Our main aim was to determine whether biting species are present and collect some data on their habitat and density.

MATERIALS AND METHODS

We investigated a wide selection of streams of different ranks in the Scrivia, Borbera, Lemme, Bormida and Belbo catchments for the presence of larvae, pupae, and adults. Larvae and

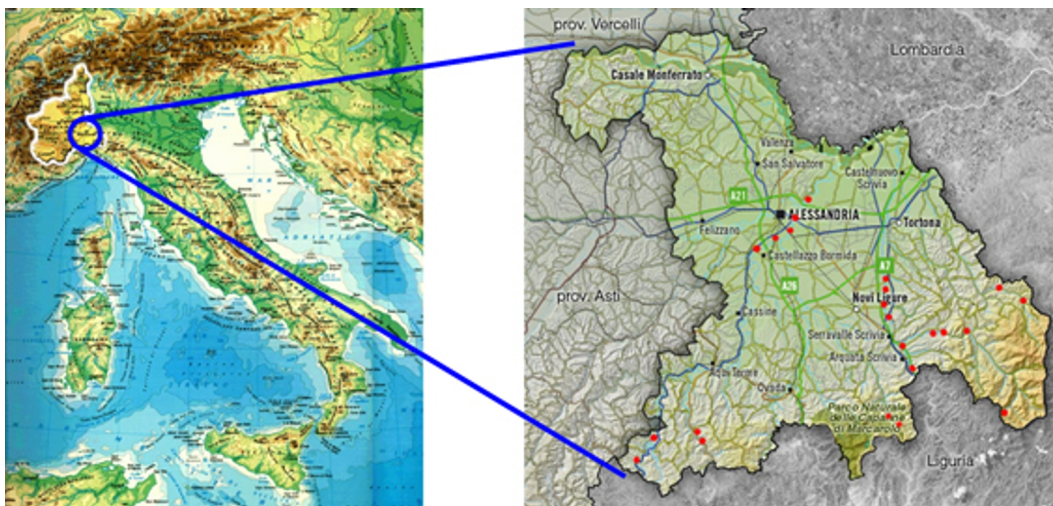


Fig. 1. Sampling stations.

pupae were collected with a kick net directly from the substratum (cobble and pebble) and from hydrophytes. All specimens have been conserved in 70% alcohol and identified to the species level by observation of morphological characters.

RESULTS

We here supplement the taxonomic list of Simuliidae (Diptera) previously presented by TALBALAGHI ET AL., (2004) with new samples collected during spring and summer of 2006 in the Alessandria Province (Table 1). The area we investigated showed good diversity of the blackfly fauna, since we found six different species of Simuliidae in an area less than a hundred kilometers long.

Assessing the composition of our taxonomical list, we noticed that the most abundant species in our sampling (*Simulium pseudequinum* = *Wilhelmia mediterranea* ssp. *fluminicola* included in the list of blood-feeding species provided by RIVOSECCHI (1978).

Table 1. List of streams and taxa collected at sampling stations.

River	Order	Station	m a.s.l.	Taxa
Lemme	II	SLe4	600	<i>S. argyreatum</i> ; <i>S. auricoma</i>
Rio Acque Striate	II	SLe5	450	<i>S. auricoma</i>
Scrvia <i>sylvaticum</i>	IV	SSc2	150	<i>S. (W.) pseudequinum</i> ; <i>S. (E.)</i>
Scrvia	IV	SSc4	158	<i>S. (W.) pseudequinum</i>
Scrvia <i>velutinum</i>	III	SSc5	220	<i>S. (W.) pseudequinum</i> ; <i>S. (E.)</i>
Scrvia	III	SSc6	240	<i>S. (W.) pseudequinum</i>
Scrvia <i>velutinum</i>	IV	SSc7	180	<i>S. (W.) pseudequinum</i> ; <i>S. (E.)</i>
Borbera	III	SBb2	275	<i>S. (W.) pseudequinum</i>
Rio Berga	I	SBg1	800	<i>S. (O.) auricoma</i>
Erro	III	SEr2	280	<i>S. (W.) pseudequinum</i>

DISCUSSION

Simuliidae are characterized by strong zonation (RIVOSECCHI, 1978), which is also noticeable in our survey. The species *S. argyreatum* and *S. auricoma* were found only in the upper reaches of fast-flowing Apennine streams of low rank (I-II), while *S. pseudoequinum* and *S. velutinum* were present in larger streams of major rank (III). *Simulium sylvaticum* was found only in the channel of a low-lying stream in the Scrvia catchment.

Analyzing the first data, we note that the presence of different Simuliidae species seems not to be correlated with the biological status of different streams, but only with the hydro-morphological conditions of the lotic systems.

Although the Simuliidae community is stable, the streams and rivers in the study area are affected by strong hydrological changes every year. Especially in the last summers, droughts have been more and more severe, so it is possible that the annual distribution and density of Simuliidae larvae change. In recent works, FENOGLIO ET AL. (2006) and BO ET AL. (2005) demonstrated that some taxa can resist prolonged drought by using the hyporheic zone as a refuge.

CONCLUSIONS

As mentioned above, we found *Wilhelmia mediterranea* ssp. *fluminicola*. In the new inventory of CROSSKEY & HOWARD (2004), this species is a synonym of *S. pseudequinum*, so we followed the new nomenclature. The density of this species was high, especially in two streams on a high plain with very wide channels and mainly cobbled substrata. In these streams, the presence of sheep and other animals is intense because shepherds use the nearby floodplain as a breeding site for their animals.

The density of larvae as estimated during field sampling differs greatly among sites. High densities were found in streams of rank with high flow speed and low water temperature.

Where periphyton covered riverbed substrata, Simuliidae larvae and pupae were very sparse or were not present at all, which agrees with the findings of RIVOSECCHI (1978).

Although there was no evidence indicating the possibility of massive attacks by Simuliidae, the density of larvae and pupae of blood-feeding species (*S. pseudequinum*) at some stations was high enough to cause problems to nearby inhabitants and animals. The stream branches where *S. pseudequinum* was found are characterized by the presence of multiple channels with medium-large granulometry (cobbles and pebbles). In this type of stream, riparian vegetation is generally far from the active channel and does not cover the water, with the result that water temperature rises markedly during summer. Some branches of these streams run near densely populated areas, so monitoring the taxonomical composition and presence of larvae could be a good way to prevent future problems.

ACKNOWLEDGEMENTS

We are grateful to Dr. Chiara Losso of the Department of Environmental Sciences of the University of Venice for materials and useful assistance. We also thank Dr. Stefano Fenoglio for his suggestions during the study.

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