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## OPERATIONAL AND SCIENTIFIC NOTES

FIRST RECORD OF *Aedes albopictus* ESTABLISHMENT IN ITALYG. DALLA POZZA<sup>1</sup> AND G. MAJORI<sup>2</sup>

**ABSTRACT.** In September 1991, the first breeding populations of *Aedes albopictus* were discovered in Veneto Region, Italy. Larvae were collected in a wide variety of peridomestic containers and in used tires. Attempts were made to eradicate this species from infested areas. No larvae or adults of *Ae. albopictus* were found from October 1991 onwards. It is not yet assessed if this was because of the control measures taken or due to the low fall temperatures and the short critical photoperiod prevailing in the area (L:D, 12:45). Since tire casings are believed to be the primary mode of introduction and dispersal of *Ae. albopictus*, an investigation of tire retreading operations was initiated to determine the source and mode of introduction of *Ae. albopictus* into Italy.

The discovery and widespread establishment of the Asian Tiger mosquito, *Aedes albopictus* (Skuse), in the continental USA (Sprenger and Wuithiranyagool 1986, Francy et al. 1990, Rai 1991) and Brazil (Forattini 1986) have heightened concerns over the potential impact of this exotic vector on public health in the Americas.

Previously, a single adult female of *Ae. albopictus* was collected and identified in Italy on September 1990 in the city of Genoa, Liguria Region (Sabatini et al. 1990). The source of this single specimen is uncertain. The only other European country to report the presence of *Ae. albopictus* is Albania (Adhami and Murati 1987).

This note reports the first breeding population of *Ae. albopictus* in Italy. On August 26, 1991, numerous daytime biting mosquitoes were collected in southern Padua (Veneto Region), about 1.5 km from downtown Padua. These collections were made during a routine larval and adult mosquito survey by a mosquito control agency (AMNIUP, Azienda Municipalizzata di Igiene Urbana di Padova), consultant to the local Public Health Unit (ULSS 21). The majority of adult mosquitoes collected were identified as *Ae. vexans* (Meigen). Some adult *Culiseta annulata* (Schrank) were also collected near houses. One adult female collected during a landing rate count aroused particular interest because of its unusual body appearance. This specimen was identified locally, and later confirmed in the Laboratory of Parasitology, Istituto Superiore di Sanità, Rome, as *Ae. albopictus*.

A thorough survey of the Local Public Health Unit (ULSS 21) of Padua was initiated on Au-

gust 29, 1991, beginning with the *Ae. albopictus* positive locality. The survey included both randomly and nonrandom sampled sites. Nonrandom sites included premises at highest risk of infestation such as tire dumps.

Padua is an ancient town with 230,000 inhabitants, where many industrial and commercial activities are carried out in peripheral areas. The town is located in north Italy (Fig. 1) at 45° 23' N and 0° 35' W. The climate is mediterranean-humid, with rainfall exceeding 800 mm/year and minimum temperature of -3°C in the coldest months (December-January) and maximum temperature of 31°C. The dry season lasts from mid-June to the end of July.

Two weeks later, on September 16, 1991, inspection of an ornamental plant nursery, located in the rural district of Albignasego, 1.5 km south of Padua, revealed a remarkable abundance of different types of mosquito larvae in small water containers. Additionally, hundreds of illegally disposed used tires were found 10 meters from the nursery. Larvae and adults were found in a wide variety of peridomestic containers, but particularly in used tires. During this inspection of several hundred tires, larvae found in 15 tires were collected and reared to adults. A total of 52 adult *Ae. albopictus* and *Culex pipiens* Linn. emerged from this collection with a population ratio of 1:1. Larvae collected from other water-holding containers were also reared to adults. *Aedes albopictus*, *Cx. hortensis* Ficalbi, *An. maculipennis* Meigen s.l. and *Cx. pipiens* in proportions of 8:5:2:5 were found in the containers. Near the breeding sites 20 female mosquitoes were collected during a landing-rate count of 15 min; all identified as *Ae. albopictus*. Adult mosquitoes and permanent slide mounts of voucher specimens were made and are currently maintained in the authors' collections.

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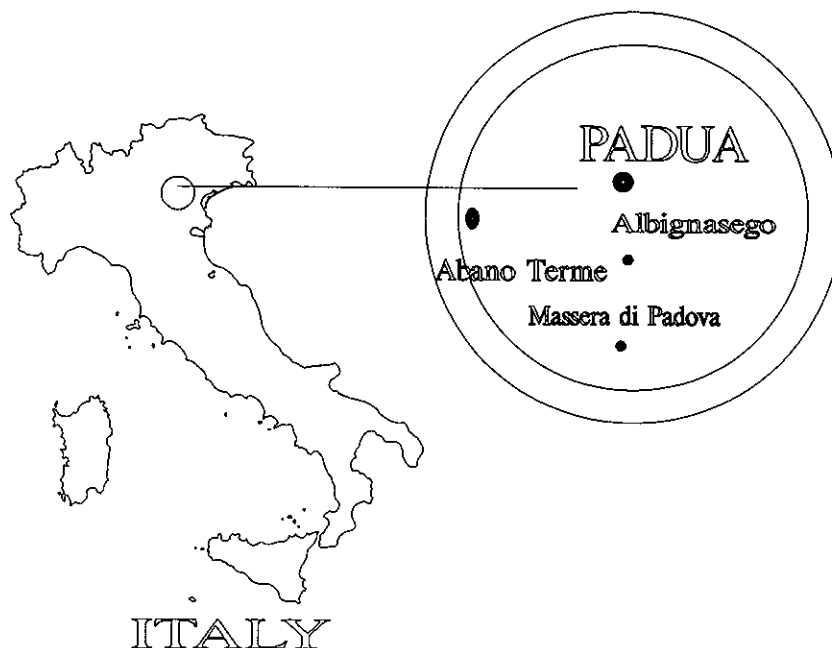


Fig. 1. Map of Italy showing the towns in Veneto region near the areas infested by *Aedes albopictus*.

Attempts were made to eradicate this species from the infested areas. Adulticiding using deltamethrin was carried out with a truck-mounted fog generator and larviciding was done using temephos. On September 24, 1991, another breeding site of *Ae. albopictus* was found in a licensed car dump, located about 1 km from Abano Terme; less than 1 km northwest of the previous breeding place. A few tire casings were found near the car bodies. At this location all tire casings were dry. However, out of a total of 220 water-filled cavities in dumped car bodies, 36 (16%) contained mosquito larvae with *Ae. albopictus* being the most abundant and found at all 36 cavities. Larviciding and adulticiding control measures were implemented immediately at the car dump. No *Ae. albopictus* were found in nearby canals and water ponds.

Since tire casings are believed to be the primary mode of introduction and long-distance dispersal of *Ae. albopictus* (Reiter and Sprenger 1987, Craven et al. 1988), we made inquiries to determine the source and mode of introduction of *Ae. albopictus* in Italy. Since 1960 only one big business in the area provides a large-scale tire retreading service. This company deals in used aeroplane tires which are imported and then recapped to be utilized as farm tractor tires. In the period from 1990 to 1991, 85% of such used tires were imported from Georgia, USA, and 15% from Holland. The origin of these tires

from Holland is unknown. The tire storage area is located in Massera di Padua, 5 km southwest of Albignasego, the site of our first *Ae. albopictus* collection. The export volume of used tires from the USA to Italy is very considerable (82,031 tires in the period 1978–85) (Reiter and Sprenger 1987). As Georgia, USA has been infested by *Ae. albopictus* since 1986 (CDC 1986), tires from that state might have carried viable eggs of *Ae. albopictus*. This assumption is also supported by an event reported by the company's staff who noticed that in May 1990, one month after the arrival of used tires from Georgia, USA, "an unusual and troublesome mosquito attack occurred for some weeks."

On October 31, 1991, attempts to recover eggs from randomly selected tires were made, but failed. In subsequent routine surveys no larvae or adults of *Ae. albopictus* were found. This was probably because of the control measures taken or due to the low fall temperatures and the short critical photoperiod prevailing in the area (L:D, 12 h 45').

In conclusion, there is no certain evidence that Georgia, USA is the undoubted source of introduction of *Ae. albopictus* to Italy, as the infestation might have been due to the 15% of tires imported from Holland, whose origin might be from either the USA or Asian countries. Surveillance will continue to determine if the infestation persists in Veneto Region. Winter

temperatures are mild enough to allow overwintering of this species.

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