POSSIBILITIES OF APPLICATION OF PREDATORY LONG-LEGGED FLIES (DIPTERA, DOLICHOPODIDAE) FOR BIOLOGICAL CONTROL OF PESTS

I.Grichanov

All-Russian Institute of Plant Protection, St. Petersburg

ВОЗМОЖНОСТЬ ПРИМЕНЕНИЯ ХИЩНЫХ МУХ-ЗЕЛЕНУШЕК (DIPTERA, DOLICHOPODIDAE) В БИОЛОГИЧЕСКОМ МЕТОДЕ БОРЬБЫ С ВРЕДИТЕЛЯМИ

И.Я.Гричанов

Most of long-legged flies are polyphagous predators feeding on various fine invertebrates. In Hans Ulrich's recent review (Ulrich, 2004), 168 dolichopodid species from 47 genera are listed, for whom the predatory behaviour was observed. Among victims of the flies, larvae and imagoes of the lower Diptera (mosquitoes, gall-midges, black-flies) and eggs and larvae of tabanid and other dipteran flies have been recorded more often; higher attention to these insects, probably, results from their big medical and veterinary significance. For example, high rate of damaged eggs in batches and important role of dolichopodid predators in regulation of Tabanidae population density in nature have been marked (Negrobov, Oganesyan, 2003). Among other insect groups whose representatives are eaten by long-legged flies, imagoes and larvae of springtails, thrips, psocids, homopterans, occasionally eggs or larvae of dragonflies, beetles and moths are recorded. From other groups of fine invertebrates, arachnids, oligochaete worms, millepedes worth noting. Selecting prey, dolichopodids obviously prefer invertebrates having soft covers.

Many scientific works describe value of long-legged flies in forestry, first of all, value of flies of the genus *Medetera* as highly effective predators of cryptic stem and bark pests. In Russia in 1960-s, the first attempts to their breeding and use for control of bark beetles and other harmful coleopterans were made. The history of their investigation as regulators of xylophagous insect population density numbers many decades (Gusev, 1928; Nikityuk, 1951; Zinov'ev, 1957; Tarasova, 1968; Nikitskii, 1971-1980; Kharitonova, 1972; Kolomiets, Bogdanova, 1973; Bogdanova, 1974; etc.). Application of long-legged flies and other entomophages in forestry practice as bioagents has not found way to practice, probably, by economic reasons. Regulatory role of *Medetera* species has been studied in Estonia, Georgia, Latvia, Lithuania, Ukraine and many other countries (Gaprindashvili et al., 1967; Ozols, 1971; Kobakhidze et al., 1973; Gavyalis, Yakaitis, 1974; Girits, 1975; Ounap, 2001; etc.).

Meanwhile, dolichopodids have a great importance for agriculture. They have been recorded in considerable amounts in orchards (apple, pear, peach), vineyards, winter and spring wheat, evidently being a stable component of these agroecosystems (Grichanov, 1990, 1991, 1997; Negrobov, Kamolov, 1992; Grichanov, Shamshev, 1993). *Medetera* flies can also feed on aphids, thrips and mites populating plants of grain, vegetable, fruit and other cultures, together with other entomophages regulating development and reproduction of dangerous pests, especially at irrigation farming (Rathman et al., 1988; Meuffels et al., 1988; Brunel et al., 1989; Grichanov, Shamshev, 1993).

Artificial breeding of predatory long-legged flies and their application in the closed ground for control of hothouse pests seem to be rather promising. First such experiments with the *Medetera* flies have been undertaken by the Italian researchers (Moreschi, 2001, 2002a,b; etc.). They have underlined, that *Medetera* feed in hothouses and greenhouses on such harmful invertebrates, as sciarid midge *Bradysia paupera*, aphids *Macrosiphum rosae*, *Aphis fabae*, *Myzus persicae*, *Illinoia liriodendri*, whiteflies *Trialeurodes vaporariorum*, *Bemisia tabaci*, thrips *Frankliniella occidentalis*, springtail *Folsomia candida* and mites (*Tyrophagus spp.*). Three methods of *Medetera* cultivation, from rather complex and laborious to the most simple, have been tested. Having carried out the detailed analysis of biological characteristics of bred and released in hothouses *Medetera* flies, the Italian experts have noted both prospects and economic efficiency of the proposed method of biological control. We recommend all other experts in the field of biomethod application in the closed ground to pay attention to this very interesting group of insect entomophages.

INTERNATIONAL ORGANIZATION FOR BIOLOGICAL CONTROL
OF NOXIOUS ANIMALS AND PLANTS

EAST PALAEARCTIC REGIONAL SECTION

INFORMATION BULLETIN

EPRS IOBC

38

ST.PETERSBURG
2007