production after the countries of China, USA, Japan, France and Iran. Apple is a fruit species grown intensively in five continents of world. Studies on apple cultivar development were started three decades ago. Due to its economic importance, apple (*Malus pumila*) is one of the cultivated plants. In apple orchards, species-rich lacewing communities builds up comprise of hundreds of insect species. Accordint to new investigations, among the Hemerobiidae family members (Neuroptera: Hemerobiidae) *Wesmaelius subnebulosus* (4%-72%), *Hemerobius humulinus* (1%-39%), *Micromus angulatus* (3%-40%), *Sympherothrips pygmaeus* (5%-43%), *H. lutescens* (2%-14%) have been found in European apple orchards. Such species of lacewings (*W. concinnus*, *W. mortoni*, *H. pini*, *H. stigma*) migrate from forests and other plant clusters to apple orchards. Aphids are the most important lacewing prey group that according to newly researches approximately over 50 aphid species associated with apple trees. *A. pomi* is especially troublesome among other apple aphids, since it becomes resistant to most insecticides. By infesting shoots on young trees (e.g. in apple tree nurseries), it may severely reduce plant growing. The mean daily numbers of *A. pomi* nymphs consumed per lacewing individual was as follows: *Chrysopa nigricornis*, male 33, female 105, larva 60; *C. oculata*, male 42, female 56, larva 140; *Chrysoperla carnea*, larva 48. Psyllids builds up another potential prey existing group in apple orchards. Lacewing larvae in apple orchards are active from June to November indicating the probability that they preyed on psyllids in both summer and autumn. Phytophagous mites are present in most apple orchards, supplying another food source, mainly for young larvae of lacewings. All chrysopid (green lacewing) instars captures and readily accepts the mites.

**Conclusion**: Biological control experiments with lacewings in apple orchards carry out in two seasons. Using eggs of *C. carnea* at a density of 335. 000 individulas per hectare, the number of nymphs and apterviduals of *A. pomi* were reduced significantly on shoot terminals. Predator: prey ratios applies were 1:10 and 1: 19, but lacewing larvae proved to be less effective in the last case because of the lower ratio. It is necessary to know how interactions occurs between lacewings and apple cultivated areas to superior choice for biological control of pests on largely native and semi-native vegetation, such as gardens and orchards.

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**Keywords**: Apple, Biological control, Lacewing, Neuroptera

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**PE–036**

An overview of the Nerve-Winged Outline Development (Insecta: Neuroptera)

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**Objectives**: The lacewings belong to the Order Neuroptera and are described as voracious predators in the larval stage and sometimes also in their adulthood. They are an important group used in integrated biological control in field and horticultural crops. In this study aims to inform some rare known properties (Individual and embriyonic development, Hatching, Larval Growth, Cocoon Spinning and Adult Emergence) of the Neuroptera (Planipennia) development outline.
They demonstrate three larval instars. This the regular developmental pattern of Neuroptera excluding Ithonidae having five stages. Embriyonic development is not unusual in lacewings. For instance, incubation lasts 12 and 6 days at 21°C in *Micromus paganus* and *Hemerobius nitidulus*, respectively. The weight of eggs during embryogenesis regularly decreases as a linear function of total duration. All lacewing embryos have a saw-like egg burster on the labrum and clypeus to break the egg shell along longitudinal ventral breach. Hatching begins with an embriyonic moult; the successive phases in Chrysopidae. Hatching and ecdysis is a highly hazardous period during in lacewing development. The new-borned larva resting a few hours on the empty chorion is motionless, totally defenseless and it needs quietness to complete the closing of its mouth. Any mechanical disturbance during this critical phase would have a disastrous consequence, preventing later effective food intake by means of well-arranged larval symmetric jaw grooves. Larval growth out of any arrest of development is undergone rapidly in most green and brown lacewings, in which a full generation often lasts more than three weeks. The cocoon is spun by the third-instar larva which has finished its whole weight gain growth, at the end of its active predatory life. Only a few hours pass between cocoon breaking by the mature pupa and the first flight take on by the new adult in search of food.

**Conclusion**: Lacewings are divided into 17 families distributed on all continents. It is represented in all major zoogeographical regions, usually being more abundant in the tropics than in temperate region. Chrysopidae, Hemerobiidae and Coniopterygidae is important predator which is considered particularly effective at reducing several preys including of aphids, mites, thrips, whiteflies, eggs of leafhoppers, small caterpillars, scale and mealybugs., available commercially in many countries of the world for augmentative release in agro ecosystem for population management of many insect pests. Biological warfare programs applied to lacewings as an agent show us not only saved the cost of control, but also increased yield production by 15 in the most of agricultural areas. Also, it will be avoiding to use broad spectrum insecticides whenever possible, because they can kill beneficial insects too. We hope that by knowing the outline of Neuroptera development it will have contributions put forwarding the new biological struggle methods.

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**Keywords**: Biological control, Lacewing, Neuroptera, Outline of development, Pupae

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**PE–037**

**A New Subspecies of *Cortodera pumila* Ganglbauer, 1882 from Turkey (Coleoptera: Cerambycidae)**

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**Objectives**: A new subspecies is described: *Cortodera pumila meltemae* ssp. n. from Turkey. Also, a short key to the identification of all subspecies is proposed.

**Materials and Methods**: The material is the 10 *Cortodera* specimens recently collected from Aksaray and Ankara provinces. Collected specimens were identified by using the usual identification keys.