ABSTRACT: The inhibitory effects on biological properties of maize (Zea mays L. saccharata Sturt) seeds treated with chlorantraniliprole (CAP) were examined under greenhouse conditions. Maize seeds were exposed to environmentally relevant doses (0.08, 0.1, 0.2, 0.3, 0.4, and 0.5 ppm) of CAP. On day 7 of germination, morphological, anatomical, and physiological responses were determined. The most devastating inhibitory effect on germination parameters of maize seeds was on coleoptile length (90%) in 0.5 ppm insecticide concentration. Increasing concentrations of CAP resulted in decreased stomata density, compared with control. Similar results were also observed in stomata dimensions. On the other hand, high concentrations of CAP led to phytotoxic effects on photosynthetic pigments such as chlorophyll a, chlorophyll b, and carotenoid. On the contrary, the amount of anthocyanin and proline increased in proportion to increasing dosages, despite a reduction in growth. The results showed that all investigated parameters (except for proline and anthocyanin) significantly decreased with increasing insecticide dosages, compared to control (p<0.05). The changes, particularly stomatal responses, and the amount of proline and anthocyanin on the leaves of the plants exposed to CAP stress, were determined as more sensitive parameters to detect insecticidal damage.

KEYWORDS: chlorantraniliprole, seed germination, photosynthetic pigment, maize, insecticide