ABSTRACT

Both indigenous “Tamarix usneoides” and alien T. ramosissima co-occur in South Africa. Tamarix usneoides is potentially a metal and salt phytoremediation species. However, hybridisation is occurring between the two species and hybrids growth characteristics are deemed to be invasive. This study was undertaken at two sites on one Highveld gold mine, characterised by different soil types, where plant growth, reproductive potential and insect abundance and diversity were measured. This aims to establish the growth of T. usneoides in two site-species trials, and to identify differences between Tamarix taxa that are consistent across different environmental conditions and can be used for identification. This study also set out to establish if higher reproductive effort and enemy release are promoting the invasiveness of T. ramosissima. Trees in one site (a water logged, clayey “Glenrosa” soil) displayed significantly greater percentage survival, growth and reproductive effort than trees in the other site (a well drained, sandy “Hutton” soil). Extensive hybridisation between T. usneoides and T. ramosissima was observed with two hybrid states, morphologically similar to each parent species. The reproductive effort is consistently greater in T. ramosissima and T. ramosissima hybrid than T. usneoides and T. usneoides hybrid. After sampling 217 trees in this study, the three characteristics of (1) insertion of filaments into the nectar disc, (2) petal shape and (3) presence of salt glands on leaves most accurately distinguished between T. usneoides and T. ramosissima taxa. Three insect species have been identified from this study as potentially damaging agents on Tamarix spp. Insects can discern between the Tamarix tree taxa and T. ramosissima is being released from insect herbivore pressure, as very few insects and a lower diversity were recorded on T. ramosissima and its hybrids (T. ramosissima hybrids > T. ramosissima). To achieve phytoremediation objectives, careful tree identification and selection of genetically pure individuals for cloning is recommended. Additionally the removal of existing alien and hybrid plants, and further research to find a suitable host specific insect biological agent to control alien Tamarix is necessary.