Among the major challenges in invasion biology is to predict the likelihood of naturalisation, and, ultimately, invasiveness, of species from properties which can be assessed in the native range prior to introduction elsewhere. In two experiments, we tested whether reproductive traits of South African species of Iridaceae are associated with their naturalisation elsewhere. In a field experiment, we assessed the importance of autonomous seed production (i.e., seed production without assistance of pollinators) for naturalisation by excluding pollinators from inflorescences in natural populations of 10 congeneric species pairs of South African Iridaceae. All 20 species are used in international horticulture (i.e., they all have been introduced elsewhere) and one species of each pair has become naturalised elsewhere while the other has not. In a common garden experiment, we assessed the importance of seed mass, germination characteristics, and growth and survival of seedlings for naturalisation by comparing 30 naturalised and 30 non-naturalised species of South African Iridaceae. The field experiment showed that naturalised species of Iridaceae have a higher capacity for autonomous seed production than non-naturalised ones. The garden experiment showed that naturalised and non-naturalised species of Iridaceae do not differ significantly in seed mass but that naturalised species germinated faster and with a higher frequency. As a consequence of fast germination, naturalised species reached a larger size early in the season than non-naturalised species. Survival chances of seedlings did not differ between naturalised and non-naturalised species. We conclude that autonomous seed production and easy seed germination play important roles during naturalisation, at least for Iridaceae from South Africa. Therefore, we recommend that the breeding system and germination characteristics of a species be assessed before it is introduced elsewhere.

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The promotion of tomato and okra seedling growth by foliar applications of smoke–water and a smoke-isolated butenolide

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In vegetable crop production, maximum yield is achieved when there is a better emergence and stand establishment of seedlings. There is a suggestion that smoke may improve the growth of vegetable crops. This study investigated the effects of a foliar application of smoke–water and a butenolide isolated from smoke–water on seedling growth of *Lycopersicon esculentum* Mill. (tomato) and *Abelmoschus esculentus* (L.) Moench (okra). Treating okra seedlings with smoke–water significantly increased shoot/root length, shoot fresh/dry weight, number of leaves, total leaf area and absolute growth rate (AGR) compared to the control treatment. However, the seedling vigour index (SVI) did not improve as there was no significant difference in root fresh weight. On the other hand, foliar applications of smoke–water and butenolide showed a pronounced effect on the seedling growth of tomato. Most of the growth parameters examined for both treatments increased significantly, resulting in a significantly higher SVI and AGR than the control. This study indicates that the foliar application of smoke–water or the butenolide may be a useful and inexpensive technique for enhancing seedling growth of vegetable crops.

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Chemical variation in selected Karoo medicinal plants

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Nine species of medicinal plants from the Karoo region, chosen for their wide spectrum of use and importance in traditional medicine, were studied for possible regional variation in main chemical constituents. These are *Ballota africana* (*kattekruie*), *Carpobrotus edulis* (*suurvy*), *Conyza scabrida* (*oondbos*), *Dodonaea angustifolia* (*ysterhouttoppe*), *Elytropappus rhinocerotis* (*renosterbos*), *Galenia africana* (*kraalbos*), *Oncosiphon suffruticosum* (*stinkkruid*), *Parmelia* spp. (*klipblom*) and *Viscum capense* (*lidjiestee*). Although many traditional uses have been recorded for these plants, there is limited published information on the main chemical compounds and especially their geographical variation. The aims of this pilot study were to: (1) find suitable methods for extraction and thin layer chromatography of the different species, (2) record chemical fingerprints from different geographical areas and (3) decide on sampling strategies for the isolation and identification of main compounds. These results will be presented for each species together with a short summary of ethnobotanical uses.

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Systematic studies of African Apiaceae: A progress report

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