justifiably based on knowledge of the relatedness of such plants to native hosts, on the similarity of their primary allelochemicals to those found in native hosts, or on both. I will argue that these criteria risk underestimating host-range (i.e., risk false negatives) because host shifts to chemically or geneologically novel plants by newly introduced agents can occur through coincidence alone. Recent evidence from luperine chrysomelid beetles and other pharmacophagous insects suggests that evolutionarily novel compounds can elicit feeding or oviposition responses when their polarity, molecular configuration and stereochemistry at binding sites meet the criteria for depolarization of stimulatory input at peripheral neuroreceptors. Mechanisms for identifying plants with such compounds will be discussed.

The Meaning of “Host-Range” and “Host-Specificity”, and Implications for Host-Specificity Testing†

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“Host-range” and “host-specificity” are two frequently used terms in biological control. However, there has been some confusion as to their meanings and the distinction between them has never been clearly articulated. I define these terms, and argue that a better understanding of these concepts will in turn provide a valuable conceptual basis for conducting host-specificity testing.

In simplest terms, the host-range of an insect represents the sum of plant species which are hosts. Host-range breadth is frequently described according to the phylogenetic relatedness of hosts, thus we can distinguish between monophagous, oligophagous and polyphagous insects. The host-range of an insect has a genetic basis, but can also be affected by prevailing conditions. We can therefore distinguish between the fundamental host-range, which includes all the plant species which an insect is capable of accepting or utilising as a host, and the field (or realised) host range which is what actually happens1. The field host-range is frequently a subset of the fundamental host-range because the insect and a potential host may never coincide in space and time. Even if they do coincide, the potential host may still not be attacked because: i) a prior step in the life cycle (such as oviposition) may not recognise it as a host; ii) the insect may never be sufficiently deprived to accept a poorer host (i.e. time-dependent effects); or iii) an insect’s behaviour might be strongly biased by effects of prior experience.

Host-specificity is a continuum from extreme specialists with a host-range restricted to a single host species, to so-called generalists which have a broad host-range. However, the host-specificity of an insect can be further differentiated according to how acceptable and/or suitable hosts are relative to each other. For example, an insect which performs equally well on all host species is less host-specific than an insect for which only one of many species is a good host, even though their host ranges are identical. There are there-

FOOTNOTE: Full paper in
fore two dimensions when assessing how specific an insect is - host range breadth and how “good” hosts are relative to each other. Although the host-specificity of an insect is frequently defined in relation to its complete life cycle, it can also be described for particular aspects such as pre and post alighting behaviours, adult feeding, nymphal development and oogenesis.

The distinction between fundamental and realised host range, and emphasis on the two dimensions to host-specificity, give us the conceptual framework with which to predict non-target effects both accurately and cost-effectively. The most inclusive set of plant species that could be at risk can be determined by estimating the fundamental host-range. This can be done accurately by experimentally excluding possible environmental constraints to host-range such as coincidence between insect and host (by using representative plant test lists), time-dependent effects (by using no-choice trials conducted for the duration of the insect’s life), and effects of prior experience (by using newly emerged, naive, insects). If the fundamental host-range includes non-targets we can predict what will happen under particular ecological conditions. This might include predicting field host-range (by considering possible environmental constraints), and obtaining a more complete picture of host-specificity by determining how “good” hosts are relative to each other in order to predict relative attack, and ultimately relative impact. The distinction between fundamental and realised host range can also be exploited to better assess the risk of genetic host-range expansion. Concepts of host range and host specificity, and their relevance to the host-specificity testing of potential biological control agents, are discussed further in van Klinken¹.

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**Brazilian Peppertree - Prospects for Biological Control**

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The woody plant *Schinus terebinthifolius* (Anacardiaceae) Brazilian peppertree (BP) is native to South America and is common in Southern Brazil. It was first introduced into the U.S. before 1800 and then reintroduced in 1840 as an ornamental. In Florida this plant is listed as a category of invasive species by the Exotic Pest Plant Council and is estimated to infest more than 405,000 ha in central and south Florida. BP displaces native plants and disrupts natural communities, forming dense stems that reduce the biological diversity. This plant also spread in Hawaii and South Africa where it is considered a weed. Surveys for natural enemies in South America were initiated in 1987, and have continued since 1994 on a cooperative agreement between University of Florida and Federal University of Parana State. The insects bionomics like thrips *Pseudophilothrips ichini* Hood (Thysanoptera), sawfly *Heteroperreyia hubrichi* Malaise (Pergidae), leafroller