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Figure 2. Different types of insect mountings.

workers seriously engaged in the taxonomic study of insects in India. Taxonomy that deals with identification of insects is a basic requirement to know their correct names prior to taking up any kind of studies on them. However, rampant collection of precious species of insects in the field for the sole purpose of submission of specimens to fulfill the curriculum requirement without proper training in taxonomy does not serve the purpose. More importantly, it affects insect biodiversity of a particular region.

About 60,000 insect species are described in India and 0.4-0.6 million or more insect species are yet to be discovered and catalogued. Hence, insect taxonomy in the curriculum is crucial to train students in India. As different types of mounting (Figure 2), preservation, and naming of diverse species of insects are part of the basic training in taxonomic study, students could be asked to collect various household insect pests such as cockroaches, houseflies, mosquitoes, ants, and other agricultural pests for this purpose. A batch of students should not be allocated to collect the same species of insects (which are not pests) in large numbers from the field for paltry submission of specimens. Using existing laboratory specimens or utilizing a few vital specimens from the field, students could be trained meticulously in taxonomy.


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Incidence of a mosaic disease in Jatropha curcas L. from eastern Uttar Pradesh

Jatropha curcas L. (Ratanjot) is an important multipurpose plant belonging to the family Euphorbiaceae. It is cultivated mainly for non-edible oil on wastelands to prevent soil erosion and as a field barrier. To some extent, the plant has gained commercial importance due to its thriving capacity in varied regional climates. During routine survey, serious disease symptoms were observed on a large number of J. curcas plants in various localities of Balrampur District, Uttar Pradesh during the rainy season of the year 2005. The symptoms consisted of mosaic from mild to severe, marked reduction in leaf size, rolling of leaf margins and puckering of leaf surface. Chlorotic areas of irregular shape were present between the secondary veins (Figure 1a and b).

Transmission tests were conducted with seeds collected from diseased plants. The seedlings remained healthy showing that the seeds do not transmit the disease.

Sap transmission from diseased leaf to healthy, vigorously growing test plants of J. curcas seedlings that were raised in an insect-proof chamber was done in the usual manner using carborundum powder as an abrasive. Test plants developed mild mosaic after twenty days showing that the disease was sap-transmitted. The disease was also transmitted by cleft graft in new shoots showing typical symptoms of the disease, thus confirming its viral nature. Attempts to transmit the disease by dodder (Cuscuta sp.) failed.

The disease could not be transmitted to any other plant, except J. curcas. Attempts made by sap inoculation and grafting to Nicotiana glutinosa L., Lycopersicon esculentum Mill., Solanum melongena L., Datura stramonium L. and Carica papaya L. were not successful. Insect transmission trials were conducted with Aphis craccivora Koch, Aphis nerii B. and Bemisia tabaci Gen. The test insects were allowed to feed on diseased plants for 24 h. These were then released on 30-day-old J. curcas seedlings. Ten to 15 insects were allowed

Figure 1. a. Healthy leaf of Jatropha curcas L. b. Infected leaf of Jatropha curcas L. with mosaic symptoms.
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Whither the alluvial fan research?*

Alluvial fans are depositional landforms whose surface forms a segment of a cone radiating downslope from a point where major drainages leave mountains. Knowledge of the fan-building process, its depositional facies, and stratigraphic buildup is important for exploration of economic deposits, groundwater prospecting, contaminant-dispersion problems, and in hazard prediction and mitigation plan for expanding human settlement on the fan surfaces in the mountainous regions.

In recent times, the definition of alluvial fan and its deposits has been the subject of a major controversy. It was proposed that alluvial fans are distinctly different from and are virtually devoid of stream-channel deposits, and they form, small, coarse-grained sediment cones, having surface slope of 1.5° to 25°, made up exclusively of debris flow or supercritical sheetflood deposits. Attempts were made to show that geomorphology and sedimentology of braided streams (commonly believed to be a major component of alluvial fans) are different in being lens-shaped, cross-stratified gravel reflecting channelized lower flow regime condition. A natural slope gap between 0.5° and 1.5° was identified based on the observation that the slope of the studied fan surfaces exceeds 1.5° and the rivers normally slope less than 0.5°. However, many of the earth scientists contradicted this view. The debate prompted SEPM (Society for Sedimentary Geology, Tulsa, USA) to convene the first meeting on alluvial fans at Death Valley, California in 1995. As the debate on the definition of alluvial fans continued, and as newer experimental and field data continue to emerge, a second meeting in 2003 on alluvial fans was convened at Sorbas, Spain in 2003. Alluvial Fans 2007, convened at Canada was the third meeting of the series. Sixty participants from 21 countries discussed 38 oral and 18 poster presentations, spread over deliberations of three days and cushioned with two one-day field trips visiting some of the major alluvial fans of the Canadian Rockies. Pre- and post-conference field trips were also organized to examine in more details some of these active fans.

Presentations in the meeting can be divided into four major categories: (1) Experimental studies and computer modeling of fans, fan deltas or related deposits. (2) Geomorphologic investigation of fans. (3) Study on the deposits and stratigraphic architecture of fans of Quaternary or older age, supported by high resolution chronology. (4) Hazard mitigation and management of fan-related environment. In an opening review of alluvial fan dynamics, Adrian Harvey (University of Liverpool) pointed out that the major controls of the fan sedimentation include geometry and lithology of the source basin, controls of the delivery system through climate and sediment supply, and basin controls guided by base level. He illustrated the effect of these controls on fan sedimentation, with examples from Basin and Range Province of United States, Scotland and Oman. Harvey suggested that with better identification and quantification of different controls of fan development, it is possible to develop a genetic


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