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ABSTRACTS

P1633. Hybrid origin and expansion of tetraploid *Achillea* taxa from E Asia to N America: DNA-based, morphological and ecogeographical evidence

M. van Loo¹, Y. P. Guo¹, C. Vogl², F. Ehrendorfer¹;

¹Department of Systematic and Evolutionary Botany, Faculty of Life Sciences, University of Vienna, Austria, ²Institute of Animal Breeding and Genetics, University of Veterinary Medicine, Austria.

A group of 2x- and 4x-taxa of herbaceous perennial *Achillea* (Asteraceae) in E Asia has been studied by DNA-analyses (sequencing, AFLP, cpDNA PCR-RFLP) and other multidisciplinary methods. *A. acuminata*-2x belongs to *A. sect. Ptarmica*. *A. asiatica*-2x is an eastern member of the *A. millefolium* aggregate in *A. sect. Achillea*. *A. alpina*-4x and *A. wilsoniana*-4x form a nearly continuous morphological, ecological, and geographical link between the two very different diploids. A NJ genetic distance analysis of AFLP data clearly demonstrates an intermediate position of the 4x- between the two 2x-taxa. 5 plastid haplotypes were detected by PCR-RFLP analyses in these species. *A. alpina*-4x and *A. wilsoniana*-4x share one haplotype only with *A. asiatica*-2x. On the basis of all these evidence and previous cpDNA *trnL-F* and nrITS sequence data, the two allotetraploids are regarded as products of a possibly Pleistocene hybridization between an *A. acuminata*-like ancestor as father and an *A. asiatica*-like as mother. This was followed by considerable secondary genetic diversification on the 4x level and expansions from Asia into the large area of northern N America.

P1634. Investigating ancient homoploid hybridisation patterns within the genus *Diphasiastrum*

S. M. D. Aagaard¹, N. Wikström¹, J. Vogel²;

¹Evolutionary Biology Centre, Uppsala University, Uppsala, Sweden, ²The Natural History Museum, London, United Kingdom.

Several defined species within the genus *Diphasiastrum* are considered to be of hybrid origin. These assumptions are primarily based on observations of populations with intermediate morphology and high rates of spore abortion in both Europe and North-America. Cytological and molecular support for these theories is, however, lacking. The main goal of this project is to investigate and estimate the frequency of speciation through hybridisation within this genus. This primarily implies investigating congruence between cpDNA - and nuclear single copy gene sequences (LEAFY, RNA polymerase and phosphoglucose isomerase, PGI) to identify parental lineages of the putative hybrid species. As *Diphasiastrum* is known as a genus with notoriously uncountable chromosomes, assessing ploidal level is crucial to define what kind of hybridisation events that have occurred, i.e. if the hybrids are either homoploid or allopolyploid. Such data will be obtained using Quantitative Feulgen photometry. Furthermore, microsatellite - and allozyme markers will be used for a more detailed study at population level.

P1635. Reproductive isolation in Mediterranean deceptive orchids

G. Scopece¹, A. M. Nardella¹, C. Lexer², A. Widmer³, S. Cozzolino¹;

¹Università "Federico II", Naples, Italy, ²Royal Botanic Gardens, Kew, London, United Kingdom, ³ETH Zuerich, Zuerich, Switzerland.

The maintenance of species boundary among related sympatric species is clearly dependent on the strength of reproductive isolation. Orchid flowers are often highly specialised to attract and fit their pollinators, suggesting a prominent role for pre-mating reproductive isolation in maintaining species boundaries. To investigate the presence and the strength of post-mating barriers in Mediterranean orchids we performed a large number of interspecific crossing experiments and analysed fruit set production and seed viability. Then we tested the relationship between reproductive isolation and genetic distance for post-mating pre-zygotic barriers and for post-zygotic barriers. Results clearly indicate that post-mating barriers (both pre-zygotic and post-zygotic), including late post-zygotic barriers, as hybrid sterility, largely contribute to prevent gene flow among co-flowering food deceptive orchids with a generalized pollination compared with other orchid groups with an highly specialised pollination biology like the sexually deceptive *Ophrys*.

P1636. F1-dominated hybrid zones: can genome-habitat interaction alone maintain species barriers?

R. I. Milne¹, R. J. Abbott²;

¹Institute of Molecular Plant Sciences, University of Edinburgh, Edinburgh, United Kingdom, ²Institute of Environmental and Evolutionary Biology, University of St Andrews, St Andrews, United Kingdom.

F1-dominated hybrid zones (**F1DZs**) are hybrid zones in which F1 hybrids are highly fertile and make up most or all of the hybrid population. In such cases hybrid zone population structure varies dramatically according to habitat - in undisturbed habitats intermediate between those of the parents, most or all hybrids are F1s; where the habitat is disturbed or otherwise atypical, most hybrids are post-F1s. Because post-F1s are required for gene flow between the parents, this implies that genome-habitat interaction maintains species barriers in F1DZs. F1DZs were probably far more common before human interference began. Hybrid zones between *Rhododendron ferrugineum* (Acid soils) and *R. hirsutum* (Basic soils) are unique among published examples: F1s occur intermixed with both parents and a very few post-F1s on a mosaic of soil types. Here soil pH appears to determine where each genotype class grows. Implications for how species barriers might arise and be maintained are discussed.

P1637. Evolution of *Cuphea* spp. during domestication

A. A. Jaradat^{1,2};

¹Agricultural Research Service, Morris, MN, United States, ²Dept. of Agronomy & Plant Genetics, University of Minnesota, MN, United States.

Cuphea, a semi-domesticated crop, is a potential source of oil suitable for industrial uses. Indeterminacy, seed shattering and post-harvest dormancy constitute its domestication syndrome. PSR23, a selection from a *Cuphea viscosissima* Jacq. x *Cuphea lanceolata* f. *silenooides* W.T. Aiton cross, was assessed for seed, capsule, and plant morphological and physiological characters. PSR23 germplasm produced during six consecutive years showed a reduced genetic diversity favoring characters better suited to cultivation. Morphological and physiological divergence of PSR23 from its wild progenitors increased as indicated by consistent and gradual differences in the principal components structure, and by smaller fractal dimensions of seeds, capsules and mature plants. Directional selection through agricultural practices increased the frequency of tall and more erect genotypes, heavier and more circular seed with reduced post-harvest dormancy and higher germination index as compared with the wild progenitors. Indehiscence and determinacy are critical to fully domesticate PSR23. Stabilizing selection will be needed to maintain the domesticated crop.

P1638. Investigation of durability of four types of natural fibre-polyethylene composites against the fungus *Coriolus versicolor*

s. pourabbasi¹, A. Karimi², D. Parsapajoo², M. Tajvidi²;

¹Islamic azad university of malayer branch, Malayer, Islamic Republic of Iran, ²University of tehran, karaj, Islamic Republic of Iran.

In order to study the durability of four types of natural fiber-polyethylene composites containing kenaf, rice hulls, newsprint and wood flour as the reinforcement at 25% and 50% by weight against *Coriolus versicolor*, available specimens of the composites were sampled.

After preparing the specimens and culture medium (Malt Extract Agar), specimens were contaminated with cultured fungus (laboratory conditions 22C, 75% relative humidity) for fourteen weeks. After this period, weight reduction, water absorption of specimens were measured and compared with control samples. The results showed that weight reduction of samples after contamination with fungus was significant. The composites containing 50% uncompatibilized wood flour had the highest weight reduction and the composites containing 25% with 1% compatibilized wood flour had the least weight reduction as compared with other types of composites.

The highest Water absorption of samples, after contamination with fungus has been observed in the composites containing 50% uncompatibilized wood flour and the composites containing 25% with 1% compatibilized wood flour had the least water absorption.