

Botanical bibliographies

Advances in white clover research and biological nitrogen fixation as reflected in the proceedings of the XIII International Botanical Congress, Sydney, Australia, 21-28 Aug., 1981. Abstracts, Collected and produced by B.J. CARE.

The International Botanical Congress, sponsored by IUBS is one of the most representative scientific forums of the world plant biologists. The lectures of the XIII th Congress were grouped in 14 sections (general lectures, molecular biology, metabolic-, cellular- and structural-, developmental-, environmental-, community-, genetic-, systematical- and evolutionary botany, bryology, fungal-, marine- and fresh water-, historical-, and applied botany). The abstracts, collected in a representative paperback of 951 pages comprising about 2100 items signed by about 2500 contributors (an average of 1,19 author per paper) is an important and rich information in current trends of world botany. One of the conclusions which may be drawn from the figures presented above, is that botanists still prefer to work out and present their results alone. Another noticeable trend is toward the functional and environmental botany more than 50 % of lectures presented), as opposed to traditional descriptive-morphological approach; the taxonomy-nomenclature section is totally absent from the abstracts.

As a review of all the topics concerned - even in a much condensed form - is absolutely hopeless, we only exemplify the advancement of botanical knowledge as reflected in two particular cases: the interesting pasture species Trifolium repens L. (1), and in the case of biological nitrogen fixation (2).

1. In white clover research important results regarding interspecific hybridization experiments carried out using embryoculture were reported (WILLIAMS et al.), osmotic values governing circadian rhythms of leaflets measured (SCOTT), and results of experiments on flowering control in white clover synthesized (THOMAS). Regarding the genetic control of the betaglucosidate synthesis, there are reported some data regarding the glycoproteins with the molecular weight of 65 Kdalton, presumably responsible for cyanogenetic action of the enzyme determined by the alleles of the L1 series; the role of the alleles was verified by

backcross (HUGHES). In respect of the possible selective value of this allelic system the preference of snails for acyanogenic populations were reported in another paper (DIZO). In respect of the population dynamics of different white clover strains, the competitive ability of Trifolium strains stabilized in pastures dominated by Poa pratensis and Dactylis glomerata were tested during a 59 week period more intense populational flux was found in combination with Poa pratensis, but no significant differences between the tested combinations were registered at the end of the experiment (TURKINGTON). It is worth to mention that these results are not in full accordance with former findings published by TURKINGTON and HARPER in Journal of Ecology, or even with the conclusions of TURKINGTON and AARSSSEN published in the abstracts of this congress regarding the very nature of competitive ability and copadaptation between white clover and grass species. Based on results gained after the evaluation of some coadapted Lolium perenne and Trifolium repens populations, possible explanations are presented for the phenomenon as niche divergence and differential competitive ability for limiting resources such as phosphorus etc. (JARVIS et al.).

The process of coadaptation was analyzed in some general review papers (e.g. that of LAUREL; LLOYD, BLOM; COOK; ART etc.). Some of the principles presented by these authors were echoed by geneticists and plant breeders or ecologists such as BOUCHERMOT; BRADSHAW; FREY; PONNAMPERUMA and others. The new principles of plant breeding outlined for a future period were especially stressed by BOUHARMONT, suggesting that after a period of breeding of pure lines there will come a period of synthetic, multiline varieties, proper in some cases even for multi-species crop cultures. The last author also stresses, that in such new conditions results may be obtained only when species intended for common cultivation (in mixed cultures) are tested in advance for the suitability of associated companion crop.

2. The growing interest facing the biological nitrogen fixation was reflected in the lectures of the XIIIth Congress too. In the field of basic research there were reported results of molecular cloning of Rhizobium trifolii genes causing nodulation of Trifolium repens plants (J.E.HUGHES). Gene fragments cloned by transposon mutagenesis, marked by canamicine resistance alleles, were used in ADN hybridization experiments in order to identify wild allelic forms responsible for the differential nitrogen fixing efficiency of different wild strains. There were studied the protein fraction from the macrosymbionts too, in order to identify plant genes responsible for the differential fixing capacity (FORNDEN). The effect of mycorrhiza upon the activity of

nitratoreductase led to the conclusion that mycorrhiza has perhaps only an indirect role in the process, facilitating the mobilization of phosphorous reserves in the clover rhizo sphaera (OLIVER et al.). It is worth of interest, from methodological point of view, the results regarding the correlated measurement of nitrate-reductase activity (acetylene-reduction technique) and the hydrogen liberation measured amperometrically (GATES et al.). There are some other, more general lectures, connected with this topics regarding the expression of genes causing nodulation in Fabaceae (VERMA), the role of Cobalt in the process of nodulation (RILEY), the nitrogen transport in the nodulated plant (PATE) and the relative energy costs of molecular nitrogen assimilation as compared with nitric compounds (PHILLIPS).

Lectures on even more general characters connected with the problem of biological nitrogen fixation were presented by LAWRIE et al. (nodulation of Australian legumes), SPRENT, and SPRENT et al. respectively (coevaluation of legumes, Rhizobium and nitrogen sources), SIMPSON and WOODMANSEE (nitrogen cycling in pastures).

The papers presented in the Congress, included in the volume reviewed reflect the growing interest manifested by the different botanical laboratories of the world facing the biology of leguminous plants, and especially facing the pasture legumes, consumed directly by grazing a highly efficient process of animal protein production and a process in accordance with new ecological and bioethical principles of modern agriculture (GALSTON) (Sz.T.A.).

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