

**A RAPID FIELD METHOD TO DISTINGUISH
DIFFERENT FLAVONOID GENOTYPES
OF *SILENE PRATENSIS* (CARYOPHYLLACEAE).
A RE-INTRODUCTION OF A HISTORICAL PROCEDURE**

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Investigations of VAN NIGTEVECHT & VAN BREDERODE (1972) have shown that populations of *Silene pratensis* (Rafn) Gordon et Gren. in Europe are not homogeneous. In petals and green parts mono- and diglycosides of the 6-C-glucosylflavones isovitexin, iso-orientin and isoscoparin can be present (VAN BREDERODE et al. 1980). Differences among populations are found in the flavone glycosylation pattern. From the geographical distribution of the flavone glycosylating genes it is concluded that there exist at least three genetically different races (MASTENBROEK et al. 1982). One of those, possessing the genes g^G , gl and fg and able to 7-O-glycosylate the basis flavone isovitexin, is found in western and southern Europe. In the others 6-O''-rhamnosylation (gene gl^R) and/or 6-O''-glucosylation (gene Fg) can occur. For population-genetic studies a rapid screening method to distinguish these races is necessary.

It has been known for a long time that epidermal cells of some plants, among which six Caryophyllaceae species, contain a substance which gives an intensive blue colour with iodine (DUFOUR 1886). Later this so-called "soluble starch" was isolated from leaves of *Saponaria officinalis* L. and identified as isovitexin-7-glucoside or saponarin (BARGER 1902). The reaction appeared not specific for isovitexin-7-glucoside, but is also given by many other compounds, among which also other flavonoids (BARGER & STARLING 1915). Surprisingly, our investigations showed that among the at least 25 isovitexin- of vitexin-based flavones which may occur in *Silene pratensis*, isovitexin-7-glucoside is the sole giving an intense blue colour with iodine (VAN GENDEREN et al. 1983). It is thus possible to distinguish the chemical races, capable of 7-O-glycosylation of isovitexin (consequently with gene g^G), from the others.

The method consists of dipping fresh or dried petals, flowers or leaves of the species in an aqueous solution of iodine (0.01 M) and potassium iodide (0.025 M). Solutions of iodine in organic solvents are quite as able. Within some minutes cells containing isovitexin-7-glucoside turn blackish-blue; the others remain white or turn yellow. The reaction has been many times successfully applied, both with well identified specimen raised in the greenhouse by the research group "Oecological and biochemical genetics of plants" of Utrecht University, and with wild populations of *Silene pratensis*.

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