Rao and Lakshmipati[7] did for the species *R. tigrina*. According to this hypothesis there are several alleles producing different electromorphs of serum albumin in these frogs, but the multiple bands specific to each pattern are probably due to the binding of substances of smaller molecular weight to the different allelic products. We think that it is still too early to propose a different hypothesis without more genetic and biochemical studies.

1 Acknowledgments. Thanks are due to Prof. M. Kattoulas, Drs C. Triantaphillidis, H.E.J. Wijnands and Th. Sofianidou for assistance and/or valuable advice.
2 F. Werner, Zoologica, Stuttg. *94*, 1 (1938).
3 L. Berger, Acta zool. Cracov. *12*, 123 (1967).
4 H.G. Tunner and M.Th. Dobrowsky, Zool. Anz. *197*, 6 (1976).
5 L.R. Weitkamp, D.C. Shreffler, J.L. Robbins, O. Drachmann, P.L. Adner, R.J. Wieme, N.M. Simon, K.B. Cooke, G. Sandor, F. Wuhrmann, M. Braend and A.L. Tarnoky, Acta genet. *17*, 399 (1967b).
6 H.E.J. Wijnands, Zool. Jb Syst. *105*, 337 (1978).
7 P.R. Rao and V. Lakshmipati, Experientia *30*, 1246 (1974).

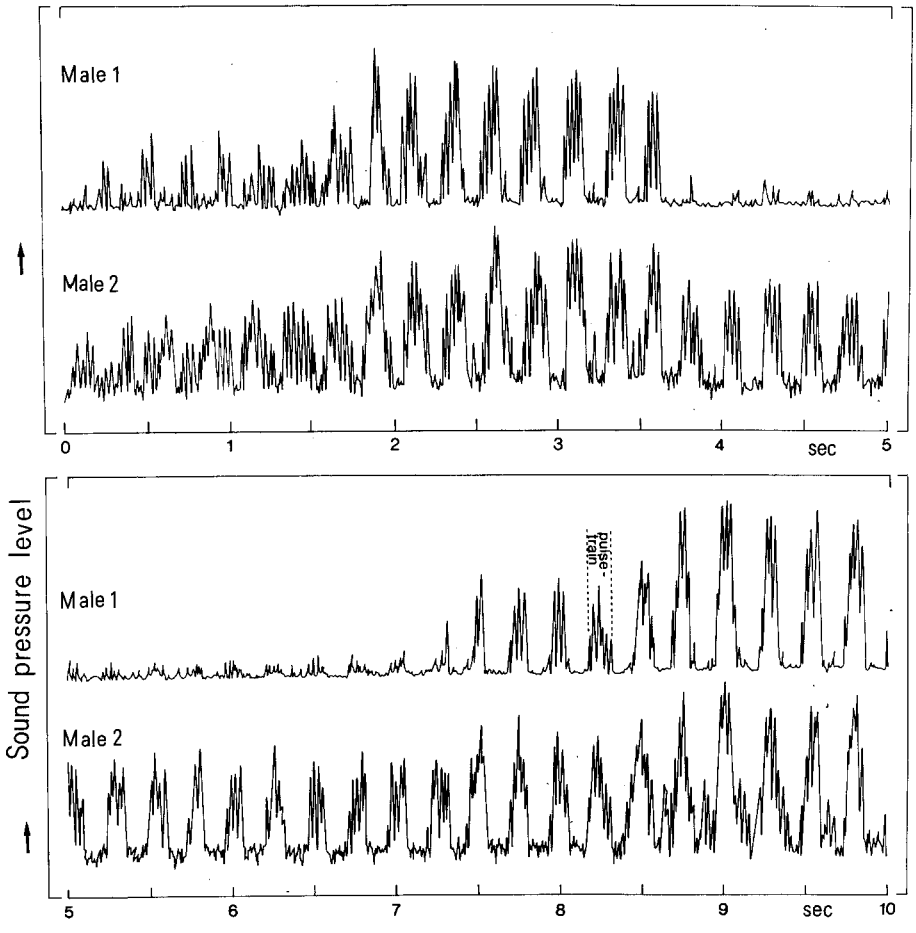
Pulse-train synchronous pair-stridulation by male *Sigara striata* (Heteroptera, Corixidae)

Christine Finke and J. Prager[1]

Institut für Zoologie, Universität Regensburg, Universitätsstrasse 31, D-8400 Regensburg (Federal Republic of Germany), 30 January 1980

Summary. Two by two, stridulating males of *Sigara striata* are able to synchronize the time structure of their calls (pulse-train synchronous stridulation).

Many species of the Corixids stridulate under water. Their calls, which are important in behaviour leading to copulation[2], are produced by stridulatory pegs, situated on the medial sides of both prothoracic femora and rubbed against the sharp edges of the head between antennae and labium. In the species *Sigara striata*[3,4], *Corixa panzeri*, *Corixa dentipes*[5], *Corixa punctata*[5] 2 or more males often stridulate in chorus. Hearing this 'chorus-stridulation' of *Corixa panzeri* or in particular of *Sigara striata* one very often gets the impression that the animals within these



Sound pressure level recording of 2 males *(Sigara striata)* stridulating together. The signals of the single animals were separated with suitable one-third octave filters.

species are able to synchronize the time structure of their calls. To what extend this synchronisation could be done was investigated for paired stridulating males of *Sigara striata*.

The stridulation signals were recorded in a small water-filled styrofoam hollow cylinder, which was protected against external noise, with a LC54M1 Hydrophone (Atlantic Res. Com.) at 18–20 °C. The output was preamplified (Tektronix Typ 122a) and recorded at 38 cm/sec with a tape recorder (Uher G 36). The fact that with paired stridulating males it is hard to separate the entry and course of the 2nd animal's signals from the signals of the leading singer on oscillograms and sound pressure level recordings, indicates a good synchronisation of the time structure of the 2 animals' calls.

An audiospectrographic analysis was made from the stridulating signals of several isolated males. 2 males, stridulating with clearly different main frequencies, were selected and put together. With the help of suitable one-third octave filters it was possible to separate their contributions to the recorded pair stridulations. The figure shows that a) the 2nd animal stridulates pulse-train synchronous (1 pulse-train represents 1 stroke of the stridulatory pegs over the edge of the head) to the leading animal and b) the entry of the 2nd animal's 1st pulse-train may already be pulse-train synchronous – if not, the animal synchronises his call after only a few pulse-trains at most.

Present studies are investigating the synchronisation of stridulation signals by 2 or more individuals of *Sigara striata* and other species more quantitatively. Additional studies on the behaviour of the animals in this situation should give some information about the biological meaning of the chorus and the synchronous stridulation.

1 Supported by Deutsche Forschungsgemeinschaft, SFB 4 Regensburg.
2 A. Jansson, Behaviour *46*, 1 (1973).
3 F. Schaller, Z. vgl. Physiol. *33*, 476 (1951).
4 C. Finke, Z. vgl. Physiol. *58*, 398 (1968).
5 J. Prager, R. Streng and J. Theiss, in preparation.

Development of photosystem I and onset of generative phase in buckwheat

A.N. Purohit[1], V.Z. Podolny and A.G. Chetverikov

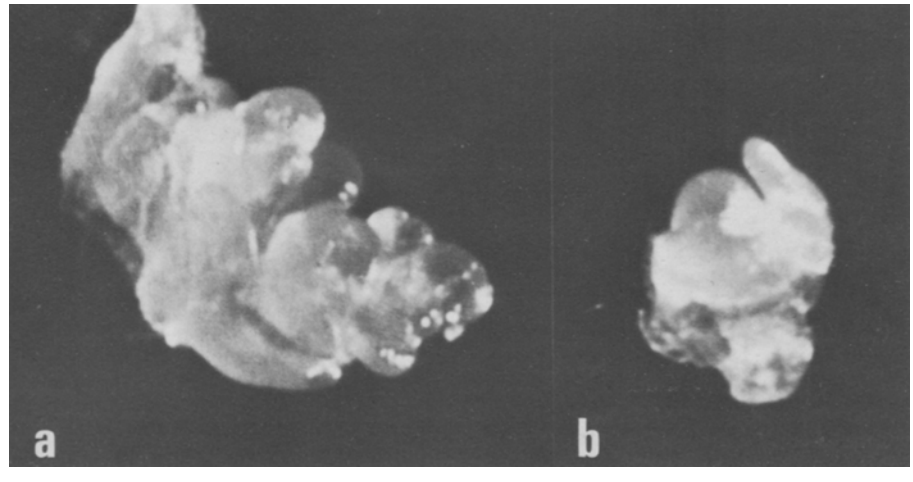
High Altitude Plant Physiology Research Centre, Garhwal University, Srinagar-246174 (India), and Institute of Plant Physiology, USSR Academy of Sciences, Moscow (USSR), 30 November 1979

Summary. The length of the generative phase and the development of photosystem I in buckwheat cotyledones were found to be correlated. Increasing days of light exposure help both of these processes. It is presumed that electron transfer during energy absorption probably serves as a prelude to further molecular events leading to the onset of the generative phase.

Recently we reported a closs association between the amplitude of ESR signal I and the onset of the generative phase in a long-day plant, *Iriticum sativum* var. albidum 43[2]. Similar trends have been found in a day-neutral species *Fagopyrum esculentum* var. chatilovskay. These results are reported here, and a general mechanism has been proposed to explain the relationship between the development of the photosynthetic apparatus and the onset of the generative phase in plants with a very short juvenile phase.

Seeds of buckwheat (*F. esculentum* var. chatilovskay) were germinated in pots containing perlait in complete darkness. After the hypocotyl hooks had opened uniformly in all pots, these were divided into groups of 40 pots each. While 1 group was left in darkness, the other one was transferred to continuous light. After every 48 h, for 6 days, 10 pots from the dark were transferred to the light and vice versa. Thus on the 8th day 8 experimental variants (as shown in the table) were available simultaneously for observation. During light and dark treatments, seedlings were maintained at 20 °C in growth chambers and those exposed to various light treatments received 35 W/m^2 light energy at plant level.

Shoot apices of 5 seedlings from each treatment were dissected after 8 days. The length of the apical dome was measured under a dissecting microscope and the stage of development was recorded. Cotyledons from these plants



Dissected shoot apices of buckwheat 8 days after germination under continuous light (a) and continuous dark (b).