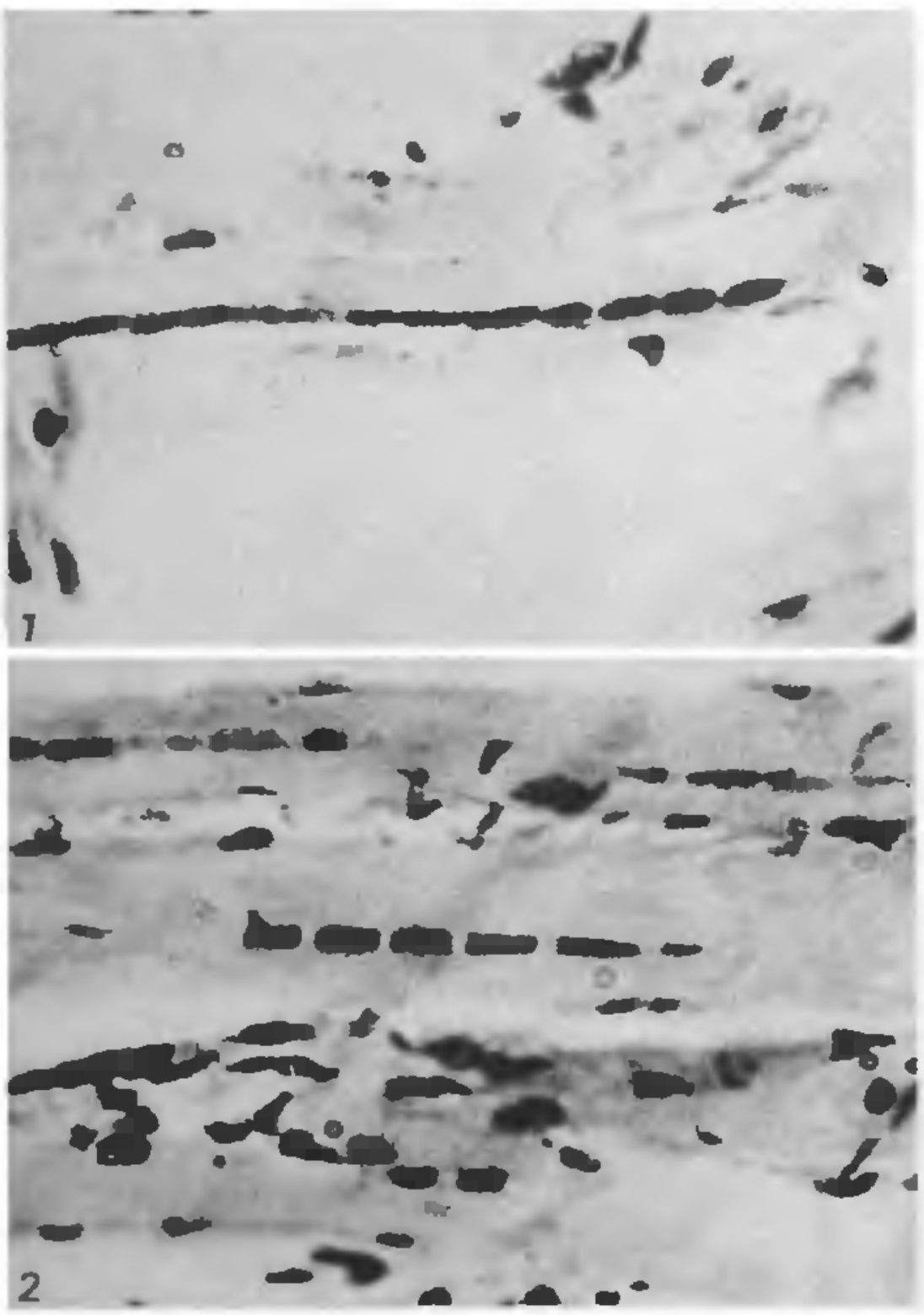
concerned. However, very little attention has been paid to the nucleus, an examination of which may reveal certain interesting observations thus indicating the extent of its participation in pathological process (myonecrosis). A ten-fold increase in nuclear number by seven days in affected rat muscles and a pronounced clumping of nuclei in groups of 2–6 in 17 days regenerated muscle fibres was shown by Klishov[7]. In the present communication, participation of nucleus during the onset and progression of muscle regeneration has been pointed out.

Administration of five repeated doses of 50 μl of 0.2% (V/V) xylotox (lignocaine hydrocholoride) with adrenaline at 8 hr intervals induces myofibre necrosis maximally in 15–20 days in *gastrocnemius* muscle of Swiss albino mice. Degenerative phase is characterized by infiltration of polymorphonuclear leukocytes in the muscles and the subsequent removal of the debris as a result of their phagocytic action. The muscle nuclei are pyknotic. Such degenerative changes have also been reported by different workers[1–5]. Simultaneously by 20th day after xylotox administration, the process of regeneration also sets in which is characterized by the appearance of central nuclei in some fibres. By 30th day post injection, the majority of the muscle nuclei acquire subsarcolemmal dispositions marking the progression of regenerative phase. This regenerative phase is typically characterized by unusually elongated and hyperactive nuclei. Such nuclei may be as long as 150 μ though occasionally nuclei with 560 μ in length are also seen (figure 1). These elongated nuclei are apparently the result of alignment and subsequent fusion of neighbouring hyperactive subsarcolemmal nuclei (figure 2). This quantitative change in the nuclear size which is new of its kind, may be regarded as of fundamental importance in the phenomenon of regeneration.



Figures 1—2. 1. Longitudinal section of *M. gastrocnemius*. **1.** 30 days after xylotox administration showing an elongated nucleus. Three nuclei (arrow) are in a process of fusion × 150. **2.** 20 days following drug administration. Note the neighbouring nuclei coming closer to each other (arrow) × 150.

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FURTHER CONTRIBUTIONS ON FASCIATION IN *CASUARINA EQUISETIFOLIA* FORST

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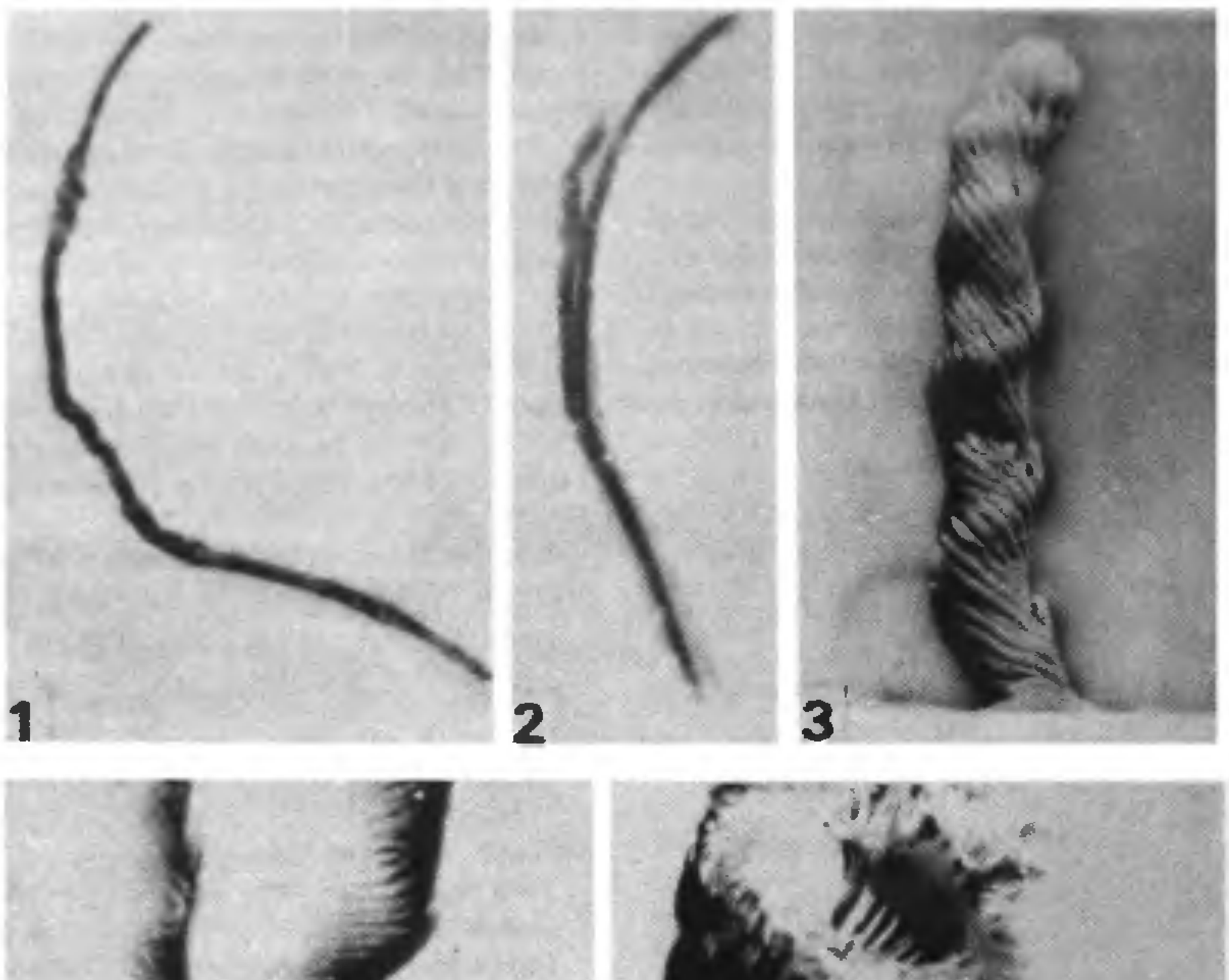
THE changes that follow injuries, losses or functional disturbances often throw much light on morpho-

genetic activities. One of the methods of studying developmental processes is to observe the consequences following experimental disturbances[1]. The unusual structural features developed on the shoot system of *Casuarina equisetifolia* Forst. are presented.

Some of the newly developing stem branches, after pruning, exhibit a band-shaped (Strap-shaped) form with a ridged growing point[2]. The strap-shaped



Figures 1–5: Unusual structural features on the shoot system of *Casuarina equisetifolia* Forst. **1.** Spiral and whorled phyllotaxy on the same shoot, × 1. **2.** Pseudodichotomy, × 0.7. **3.** Spiral phyllotaxy enlarged, × 45. **4.** Clockwise and anticlockwise spiral phyllotaxy in a true dichotomy, × 40. **5.** Funnel-shaped (ring fasciation), × 45.

branch subdivides at the apex into two or more giving rise to ribbed fasciation[3]. When the growing point divides into two, it results in true dichotomous branching (figure 4). Due to overtopping, some of the healthy and more vigorous laterals, in conjunction with the mother axis, exhibit pseudo-dichotomy (figure 2), which may very much resemble true dichotomy. Rarely funnel-shaped (ring fasciation) (figure 5) and hood-shaped fasciations are observed among normal branches. Owing to inequalities in growth (unilateral growth) still other branches terminate in a snail-like helix (figure 3) with the scale leaves in spiral phyllotaxy, in contrast with the normal whorled phyllotaxy. Sometimes spiral and whorled phyllotaxy can be observed on the same axis (figure 1). The lateral branches which develop from the coiled or twisted axis are normal. In a true dichotomy the direction of twisting of a branch is clockwise while in the other it is anticlockwise (figure 4).

The funnel-shaped fasciation may be due to the functioning of peripheral ring of initials and not by those which are centrally located. The derivatives of the shoot apical meristem in normal development differentiate into nodes and internodes in transverse plane. But in some branches such differentiation takes place in vertical plane. Moreover the unilaterally occurring nodal differentiation makes a continuous rotation (either clockwise or anticlockwise as the case may be), resulting in a continuous spiral phyllotaxy bearing innumerable leaves. The change of phyllotaxy from whorled to spiral or spiral to whorled in the same branches may be attributed to the differential mode of nodal differentiation among the derivatives of the single apical meristem.

As soon as the vertical (lateral) differentiation of node is established, the promeristem should have undergone equal branching at the nodal point leading to the formation of dichotomy with clockwise and anticlockwise twisting.

The occurrence of various categories of stem fasciation, such as strap-shaped (linear), ribbed (multiradiate), funnel-shaped and dichotomous in the single species or even in individual *Casuarina* plant is in complete harmony with the report of White[3]. Present observations agree with the statement of White[3] that linear or strap-shaped form of fasciation is most common and ring fasciation is very rare.

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INHIBITION OF NEUROSECRETORY ACTIVITY BY ECDYSONE IN THE BLISTER BEETLE *MYLABRIS PUSTULATA* THUNB.

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HAGEDORN *et al*[1] discovered the ovary as a source of ecdysone in adult mosquito. Since then, investigations have been done by injecting ecdysone into adult female insects and this hormone is found to inhibit corpus allatum activity[2-4]. It is believed that this effect of ecdysone on the corpus allatum activity could be through the neurosecretory cells of brain[2, 5]. This suggestion prompted the authors to investigate the effect of ecdysone on the neurosecretory activity in the blister beetle *Mylabris pustulata*.

Adult blister beetles were collected and maintained on shoe-flowers in laboratory cages. Groups of ten females of approximately the same weight (about 950 mg) were selected. Each was injected with 20 μg of ecdysone (inkosterone) per gram body weight of the insect using a microsyringe. The hormone solution for injection was made by dissolving 10 mg of ecdysone in 100 ml of 10% ethanol in insect Ringer's saline. The controls received an equivalent quantity of 10% ethanol-saline only.

The brain and retrocerebral complex (corpora cardiaca and corpora allata along with their associated nerves) of the control and experimental insects was dissected under insect Ringer's saline after two or three days and fixed in Bouin's fluid. Paraffin sections of 6 μ thickness were stained with aldehyde fuchsin (AF) of Ewen[6].

Two groups of neurosecretory cells (NSC) loaded with stainable neurosecretory material (NSM) are found in the brain of controls (figure 1). The NSM is transported axonally and stored in corpora cardiaca (CC) (figure 2), which serve as the neurohaemal organs. Corpora allata are devoid of the stored cerebral NSM. On the contrary, the NSC of brain (figure 3) and the CC (figure 4) are found to be devoid of NSM in experimentals.