Table 1. *Average root/shoot length of different sorghum seed samples treated with fusaric acid solution* (50 *ppm*)

Cultivar	Average root length		Average shoot length	
	Untreated	Treated	Untreated	Treated
SPV-104	3.50	3.99	2.46	2.86
IS 5675	5.67	5.94	7.77	8.91
E-35-1	6.16	8.74*	7.66	10.23*
Uchv-2 × WA × Nigerian-1	5.12	6.12	4.86	6.06
(IS 2042 × IS 225)-2	7.08	8.00	6.00	6.33

* The values are significantly different from untreated at $P \leqslant 0.05$ level as tested by t test.

Table 2. *Effect of fusaric acid* and culture filtrate of Fusarium moniliforme on seedling growth of sorghum*

Treatment	Average root length (cm)	Average shoot length (cm)
Fusaric acid	9.63	6.92
Culture filtrate	7.15	5.80
Untreated	10.10	7.02

C. D. for root length at 0.05% level 2.04; C. D. for shoot length at 0.05% level 1.00; *Source: Sigma Chemical Co., USA.

Though the average of root/shoot length was slightly more in fusaric acid treated seedlings, the values are not statistically significant except for cultivar- E-35-1 when subjected to t-test (table 1).

While the natural toxic metabolite occurring in the culture filtrate of *Fusarium* sp is known to inhibit the root and shoot elongation[11-13], the fusaric acid alone, in its purified form, did not inhibit the growth of root/shoot. Average shoot and root length of fusaric acid treated seedlings resembled that of control and the slight reduction observed in the root/shoot length in the fusaric acid treated seed was not significant statistically (table 2). However, culture filtrate of *F. moniliforme* has significantly reduced the root/shoot length when compared to control as well as fusaric acid treated set (table 2).

Thus by using fusaric acid, reliable infection percentage of different species of *Fusarium* in sorghum seeds can be recorded. As this method is less time consuming and more economical, it is more practicable than Agar plating method.

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PROPAGATION OF SINGLE LEAF WITH AXILLARY BUD IN PINEAPPLE (*ANANAS COMOSUS* (L.) MERR.)

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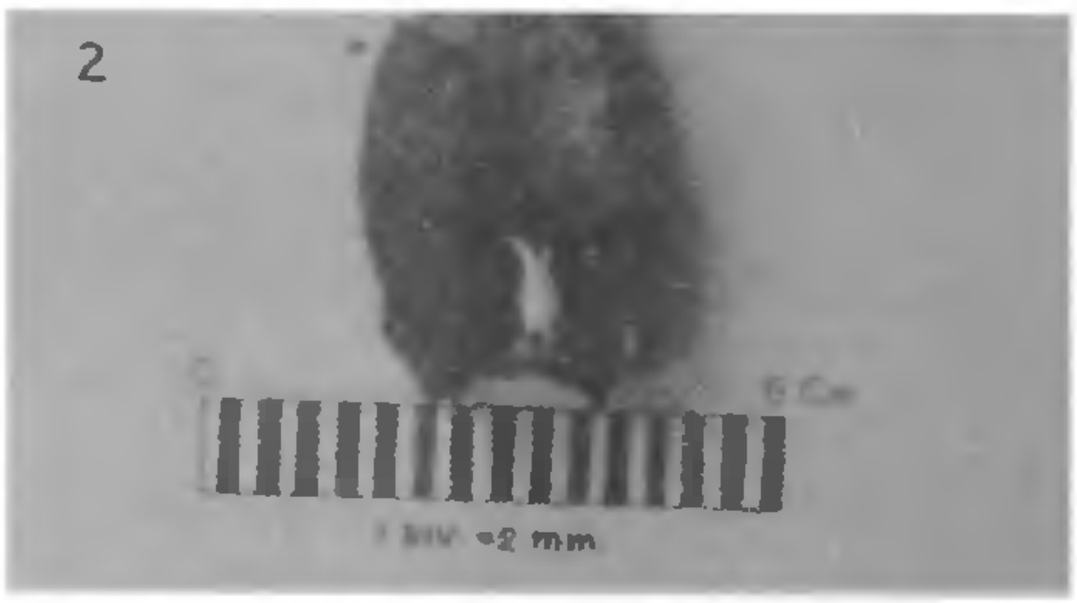
THE pineapple is a plant whose rate of natural multiplication is particularly slow. This situation is felt

more seriously when a newly developed cultivar needs to be propagated for trials or to be distributed to the growers. The plant is capable of producing different types of vegetative material usable in plantation *viz* suckers, crowns, slips etc. and we may intervene at quite different levels to promote its multiplication. Some workers have devised methods of vegetative propagation *viz* stem or stump cuttings, leaf cuttings, leaf-bud, *in vitro* propagation and others have used chemicals and growth regulators to encourage suckers, slips which have been reviewed by Py[1].

With the recommendation of increasing the rate of population density by reducing plant spacing (43,000–53,000 plants/ha) it has become essential to find out a simple and quick multiplication technique. The present note deals with the simplification of leaf-bud method of vegetative propagation in pineapple.

The outermost leaves are first peeled off from suckers, crowns or slips, until the buds start appearing on the stem. These buds are attached to one end of the leaf base. The leaves together with a piece of the stem and the bud attached to it are carefully dissected. This single leaf unit with the axillary bud is known as the 'leaf-bud' (figure 1). The process is continued until the stem and the leaf base become very brittle. The number of leaf-buds obtainable depends upon the size of the crown, slip and the sucker. However, on an average 25, 20 and 15 leaf-bud units are obtained respectively from crown, slip and sucker.

These leaf-buds are thoroughly washed in running water and planted in wooden trays containing a layer of clay soil 2.5 cm deep and above it a layer of sand 2.5 cm deep. The leaf-bud is planted firmly in the sand to a depth of about 2.5 cm so that the axillary bud remains under the sand. These trays are placed in the shade so that they get sufficient diffused light and are watered twice daily with 1/4 strength of Hoagland's nutrient solution supplemented with 5 mg/l of IBA or NAA.



Figures 1–3. 1. A typical leaf-bud after dissection ready for planting. **2.** Sprouting of leaf-bud, 30 days after planting. **3.** A three month old pineapple plantlet with roots developing from a leaf unit method of vegetative propagation.

Table 1 *Success of leaf-bud developing into plantlets obtained from different source*

Source of leaf-bud	No. of leaf-bud planted	No. of leaf-bud sprouted	Success (in %)
Crown	81	54	66.66
Slip	109	81	74.31
Sucker	85	72	84.70
Total	275	207	75.27

The sprouting of the buds starts in 30 days (figure 2) from the date of sowing and continues upto 80 days. Maximum sprouting takes place during 50–55 days. Success upto 75% was obtained by this method of propagation. The growing plantlets are transferred to the nursery beds in 90 days (figure 3) and are ready for sowing in the field in 6 months. Detailed results of the experiment will be reported elsewhere.

However, the percentage of success increases under

controlled sterilized condition. Seow and Wee[2] obtained success upto 90%.

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ACHLYA KLEBSIANA PIETERS—A NATURALLY OCCURRING FISH PATHOGEN

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WHILE surveying the pathogenic fungi associated with fish, some diseased specimens of *Nandus nandus* (Ham.) bearing white cottony patches and lesions scattered on their body were collected from a pond in a village Agaya near Shohratgarh, Basti district in March, 1983 (figure 1).

The fungus causing infection was isolated from the fish and was raised on sterile hempseed halves in sterilized distilled water. Its unifungal bacteria-free culture was prepared on the lines described earlier[1–3]. The isolate was identified as *Achlya klebsiana* (Pieters) with the keys[3,4] and the fish species was identified using the key of Srivastava[5].

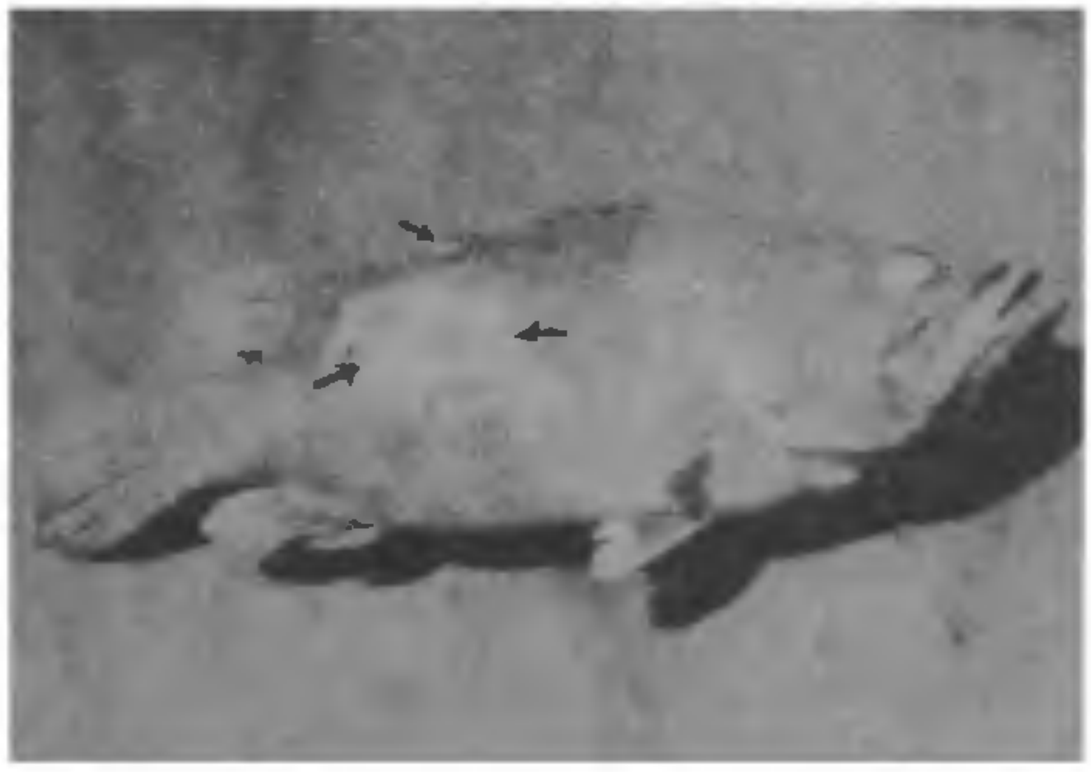

Figure 1. *Nandus nandus* (Ham.) bearing white cottony patches and lesions caused by *Achlya klebsiana* (Pieters).

Table 1 *Infectious ability of Achlya Klebsiana (Pieters) on wounded and unwounded test fish*

Name of fish	Mycosis evident within hrs	Death occurred within hrs
Wounded		
Puntius sophore (Hamilton)	18–20	86–90
Colisa fasciatus (Bl. and Sch)	21–24	92–96
Chela laubuca (Ham.)	16–18	44–46
Cyprinus carpio var *communis* (L.)	17–20	94–96

No. of fish studied – 2;
Mycosis evident and no. of fish dead – 2.

In order to establish the pathogenicity of the isolate obtained, controlled infection was studied by standard methods described by Scott and O'Warren[6] using adult individuals of *Puntius sophore* (Hamilton), *Colisa fasciatus* (Bl. and Sch), *Chela laubuca* (Ham.) and *Cyprinus carpio* var. *communis* (L.).

Hyphae of the parasites were observed growing from the injured areas of the test fish within 16 to 24 hr of placing the fish in the infection troughs. The infected fish died within 44 to 96 hr of placing them in the infection troughs. Also, the injury greatly lowered the resistance of the fish to the fungal infection (table 1). The time of death was recorded and the fish was removed from the infection trough. Fungus growing on the infected fish was isolated and compared with the cultures of the original inoculum. It was found identical with the original fungus. For the purpose of maintaining a control for experiment, two fish were kept under the same conditions but not exposed to the inoculum.

Nolard-Tintinger[7] had earlier reported the occurrence of *A. klebsiana* (Pieters) on the eyes of *Lebistes reticulatus* Peters and Vishniac and Nigrelli[8] had reported its occurrence on platyfish, but since both the reports are about experimentally induced parasitism of this fungus on fish, the present communication is the first report about the occurrence of *A. klebsiana* (Pieters) as a natural fish pathogen.

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