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# *Suckleya Suckleyana*

## A Poisonous Plant

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Colorado State College
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# *Suckleya Suckleyana*

## A POISONOUS PLANT*

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CONTENTS



DURING recent years some unexplained cattle losses have occurred in the plains section of northeastern Colorado. In a number of instances cattle have died suddenly in the vicinity of completely or partially dried-up water holes or shallow ponds. Various explanations have been given as to the cause of these deaths. In some instances bloat caused by eating large quantities of succulent material was suspected. In other cases a diag-

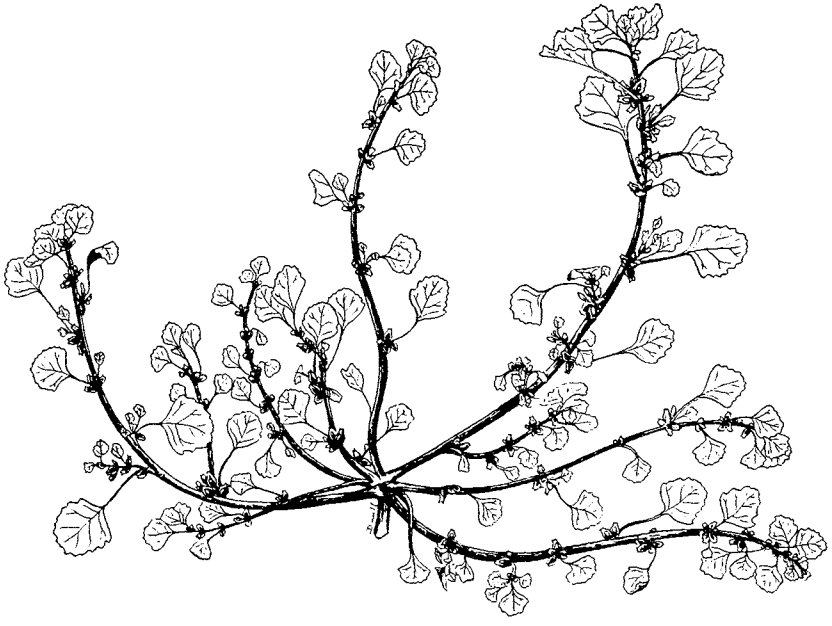

Figure 1.—Poison suckleya (*Suckleya suckleyana*); greatly reduced in size.

*The description, history and information on general distribution of the plant contained in this bulletin were furnished by the Botany Section of the Colorado Experiment Station. The chemical tests were made by the Chemistry Section.

nosis of "forage poisoning" was made, and in at least one instance anthrax was suspected, which led to the immunzation of a number of animals. Water samples from various sources have been received at the laboratory of the Chemistry Section of the Colorado Experiment Station, in the suspicion that the water itself might contain a toxic principle.

In September 1936 Dr. E. N. Stout, Colorado extension veterinarian, was called to investigate some heavy losses occurring in herds of cattle grazed on vegetation in the Empire Reservoir, near Fort Morgan, Colo. Following removal of the water in midsummer, various succulent plants made a profuse growth over most of the bottom of this reservoir. Dr. Stout was informed that 34 head of cattle had died there during 1935 and 1936. The information obtained from the owners indicated that these losses occurred rather suddenly if the cattle had access to water immediately after grazing. The history suggested that the cattle were probably dying of bloat. This seemed logical because of the extreme succulence and heavy growth of the vegetation the cattle were eating. Dr. Stout gathered a quantity of two of the plants with which he was not familiar which were prevalent in this area. These specimens were identified as *Suckleya suckleyana* and *Monolopis nuttalliana*. Although no reference was found indicating that either might be poisonous, quantities of each were fed to rabbits and guinea pigs. The guinea pigs ate rather sparingly and the rabbits moderately, but at the end of 5 days no ill effects were apparent in any of the animals. This seemed to justify the assumption that the cattle had died of bloat.

In August 1937 a veterinary practitioner was called to investigate the deaths of three dairy cattle near a water hole located in the plains section about 30 miles east of Fort Collins. The sudden deaths and the dark-colored blood were suggestive of anthrax, but a bacteriological examination of a blood specimen revealed no pathogenic microorganisms. Following the negative laboratory findings, Dr. Stout made an investigation of the premises on which the deaths occurred. He found *Suckleya suckleyana* growing in a dried-up pond near the dead cattle. Although the owner said that the cattle were not bloated, Dr. Stout suspected that such may have been the case.

A few days later a rancher in another locality brought in the viscera of a cow that had died very suddenly near a water hole. Three other cattle had died the previous day in a similar manner. He described symptoms similar to those observed in cane poisoning. He gave assurance, however, that the cattle had not had access to cane nor to any of the known cyanogenetic

sorghums. He said that in the water hole near the dead animals there was a luxuriant growth of a weed unknown to him. This proved to be the plant identified in connection with the previous cases as *Suckleya suckleyana*. Portions of it were found in the rumen of one of the dead animals. Following this history, the plant was tested, and a strong reaction for hydrocyanic acid was reported.*

## *SUCKLEYA SUCKLEYANA* (Torr.) Rydb.

### GENERAL DESCRIPTION

Although *Suckleya suckleyana* is called rare in botany manuals, it has become rather common in northeastern Colorado in moist bottoms and water holes and along the edges of lakes. Since it has no established common name, it is suggested that it be called "poison suckleya."

The stems of the plant are prostrate (fig. 1), often reddish-tinged and rather fleshy, becoming very brittle after frost. The

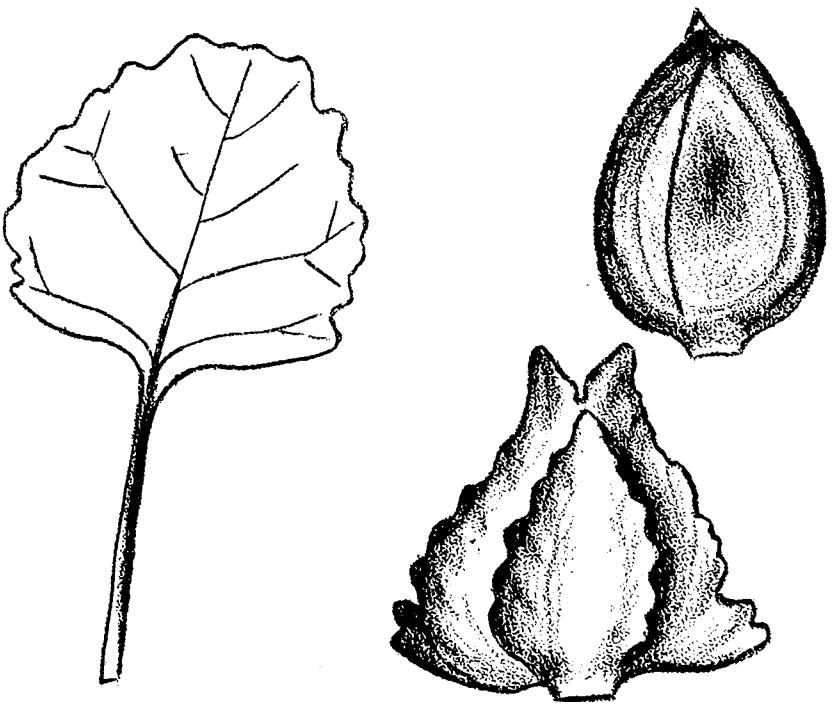

Figure 2.—Left, leaf of poison suckleya; upper right, seed; lower right, notch-tipped scales enclosing seed; all figures greatly enlarged.

*The sodium picrate paper test was used for the qualitative determination of hydrocyanic acid according to the method described by Henrici (1926).

leaves are rather round in shape, tapering to a broadly wedge-shaped base; the margins have short, triangular teeth, and the leafstalk usually is as long as the thin part of the leaf (fig. 2). The stems and leaves when young may have a mealy appearance, as if sprinkled with tiny flakes of bran, but they usually become smooth very early in their growth.

Two kinds of flowers are present. Those producing pollen are near the tips of the branches, and the seed-producing flowers are clustered in the axils of the leaves nearer the base of the plant. The seed is enclosed in two scales which are joined except at the notched tip (fig. 2). These green scales at maturity are ¼ inch long or less and dark in color. The enclosed seed turns a reddish brown.

The root is rather small, since the plant is an annual using its seed to start new plants the following season.

Suckleya may be confused with spreading pigweed but differs from it in the kind of leaf margins and the covering of the seed. The edges of the pigweed leaves are smooth instead of toothed, and the seed is not enclosed in scales.

Some of the spreading lamb's-quarters (Chenopodium) have some resemblance to suckleya, but neither do they have the flattened two-scaled fruit shown in figure 2.

The prostrate, annual saltbushes (Atriplex) resemble this plant more closely, but none of them unite in having a leaf round in shape, with the margins triangular-toothed and a two-scaled fruit shaped like that shown in the drawing.

TECHNICAL DESCRIPTION AND DISTRIBUTION.—*Suckleya suckleyana* (Torr.) *Rybd.*, *Obione suckleyana* Torr., *Atriplex suckleyana* S. Watts., *Suckleya petiolaris* Gray.

Succulent, annual herbs with stout, terete, much-branched stems 10 to 30 cm long; these prostrate or ascending (our specimens are definitely prostrate except where growing in crowded mats). Stems sparingly furfuraceous-scurfy to glabrate, often reddish and striated. Leaves alternate, rather numerous; petioles long, usually longer than the blades; the blades suborbicular to rhombic-ovate, 1 to 3 cm long, with rounded apex and rather short cuneate base, margins repand-dentate, teeth short and triangular, the whole leaf glabrate.

Plant monoecious, the flowers in clusters in the axils of nearly all the leaves, with the staminate in the upper axils—these without bracts or bractlets—with membranaceous three- or four-parted calyx, two of the segments larger, stamens three or four with broad, flattened filaments. Pistillate flowers lower

(often mixed with staminate flowers at their upper limits); bibracteate, the bracts obcompressed (this character may be difficult); ovate-rhombic, subhastate at base, bidentate at apex, narrowly winged dorsally, the wings crenulate, glabrous or nearly so, 4 to 6 mm long. Seeds ovate, about 3 mm long, reddish brown, embryo sub-annular, with superior radicle forming an apiculate projection at the tip of the seed.

In addition to the typical form, a late-fall seedling stage has been found which may not be over 1 cm in length. This consists of two linear cotyledons and from one to several small leaves, bearing flowers and fruits in their axils (fig. 2).

### DISTRIBUTION

Listed in the manuals as occurring in valleys along streams from Montana to Colorado; mentioned as rare. Specimens were sent to the National Herbarium at Washington, D. C., from near Fort Collins, Colo., for identification. This brought a request for herbarium material, since this species is not well representated in the collection at Washington.

The plants were reported for Colorado by Rydberg in 1906, in his "Flora of Colorado," as from Denver, Cheyenne Wells, and 6 miles southeast of Golden. They are now rather prevalent in moist sink-holes around the borders of lakes and irrigation reservoirs in the area east of Fort Collins, Colo.

## INVESTIGATIONS

### HYDROCYANIC ACID CONTENT

After finding hydrocyanic acid in one specimen of *Suckleya suckleyana*, a survey was made of premises and localities where previous losses had been reported. In a limited amount of travel the plant was found growing in 20 water holes located in four counties: Larimer, Weld, Logan, and Morgan. At or near eight of these water holes, 22 cattle died during the past summer, with a history which suggested hydrocyanic acid poisoning. Plants were collected from a number of these places, and all gave a positive reaction for hydrocyanic acid. A quantitative* determination was made on samples from two different sources. From one water hole a specimen of a mature plant which had apparently been responsible for the deaths of eight cattle contained 0.0364 percent of hydrocyanic acid. Three specimens of much younger plants, taken from the bottom of the Empire Reservoir, contained 0.005, 0.002, and 0.011 percent, respectively, of hydrocyanic acid. Soil samples from these areas were

*According to the method of Kohn-abrest. Ann. Fals., 1920, 13, 482.

found to be rich in nitrates.* For the purpose of comparison, a quantitative hydrocyanic acid determination was made on a specimen of stunted, partially dried sorghum. This had 0.0135 percent of hydrocyanic acid. Pinckney (1924) found that the hydrocyanic acid content of cane varied from none to 0.023 percent when grown on untreated soil. He found that the hydrocyanic acid content increased as nitrate was added to the soil.

## ANIMAL-FEEDING EXPERIMENTS

### CATTLE

In an effort to determine the toxicity of *Suckleya suckleyana* for cattle, two young, vigorous animals about 1½ years old were obtained from the owner of the ranch** on which four cattle had previously died. On this place the experiment was conducted September 9, 1937. Feed and water were withheld from the cattle for 24 hours, and a quantity of the freshly gathered plant from the source which showed 0.0364 percent hydrocyanic acid was placed before them in a dry lot. They ate a very small quantity of the weed soon after it was given, after which it was ignored. The cattle were observed for 5 hours, during which

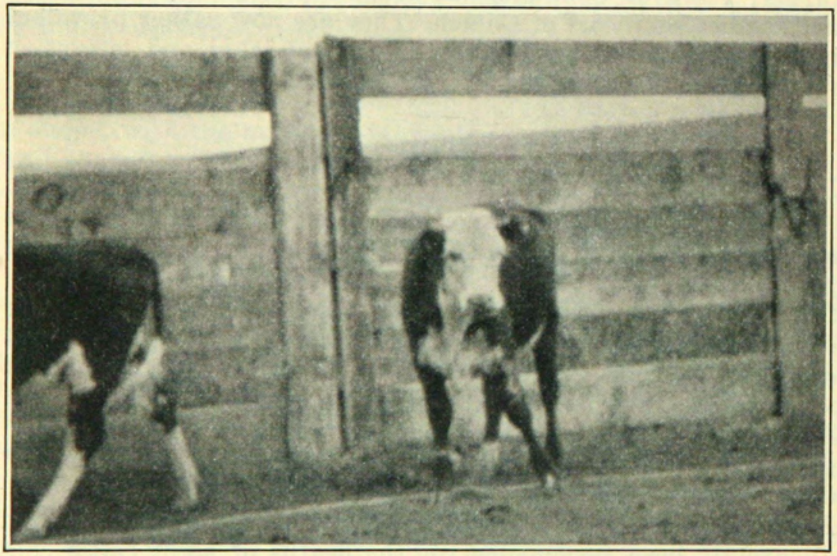

Figure 3.—Beginning of muscular incoordination as a result of poisoning in the case of the steer fed poison suckleya in experiments.

*By the diphenylamine test.

**The authors are grateful to A. S. Kester, Willard, Colo., for his cooperation in obtaining the cattle and furnishing suitable facilities for conducting the experiment.

time no abnormal behavior was noticed. Preparations were then made to force feed the two animals.

Some of the *Suckleya suckleyana* was finely ground with a food chopper, and approximately a gallon of the material was given to each by means of a stomach tube and washed down with about 3 gallons of water. The first to receive the ground plant was a Hereford steer estimated as weighing 550 pounds. The animal was force fed at 2:50 p. m. In about 20 minutes the steer showed evidence of beginning distress, manifest by disinclination to move, glassy eyes, muscular twitching (fig. 3), licking the lips with the tongue, dribbling urine, and eventual staggering (fig. 4). Finally, unable to stand, the animal went down in 40 minutes after the feeding. At this time the visible mucous membranes showed a reddening which changed before death to cyanosis. The heart became fast and weak and eventually irregular. Respiration was slow and labored. While down, the head was drawn back (fig. 5); occasional spasms occurred, followed by swinging of the legs and head. Following a spasm, respiration would cease for a moment, the animal would appear as dead (fig. 6) and then would revive. This chain of symptoms continued until the final spasm. After respiration ceased the heart continued to beat for a short time. The steer died 1 hour and 40 minutes after receiving the ground plant (table 1).

The autopsy showed that the blood was black and that it did not coagulate within a half-hour after death. The heart was not dilated, and its muscular wall was normal. There was a visible congestion of the mucous membrane covering the folds of the abomasum and the initial portion of the duodenum. The bladder, despite the continuous dribbling of urine, was distended. No other lesions were observed. The portions of the plant which had been voluntarily eaten were all found in the rumen, while the ground material was found entirely in the reticulum, omasum, abomasum, and initial portion of the duodenum. A sample of the rumen contents taken from this animal gave a strong positive test for hydrocyanic acid.

The second animal used in this experiment, a 600-pound Hereford heifer, was fed approximately the same quantity and in the same manner. The symptoms presented were identical and followed the same course as in the previous case, up to the time the animal went down. This occurred in 30 minutes after feeding. Instead of allowing the case to proceed, 4 gm of sodium nitrite in a 10-percent aqueous solution was given intravenously at this time. When the injection was made the blood from the jugular vein was bright red in color. Recovery following

Figure 4.—Steer used in suckleya-feeding experiments, staggering before falling as a result of poisoning.

the administration of sodium nitrite was rapid. However, in 15 minutes 6 gm of sodium thiosulphate in a 10-percent solution was administered in a like manner. The animal was then extremely vigorous, making medication difficult. The venous blood appeared to have a normal color. In an hour following the last treatment the heifer was contentedly eating hay and was apparently normal. In a later observation the animal appeared to have recovered completely (table 1).

Losses of cattle being grazed in the Empire Reservoir have been reported to the Colorado Experiment Station for several years. In a survey (Sept. 1937) of the reservoir which had been drained some 2 months previously, sections of the bottom were found completely covered with a growth of *Suckleya suckleyana*. It was decided to conduct a feeding experiment to determine the toxicity, for cattle, of the plants growing in the reservoir. This seemed advisable because of the reported losses during previous years. A determination of the quantity of hydrocyanic acid in three specimens of the plant from different areas in the reservoir showed percentages of 0.011, 0.005, and 0.002, respectively. The experiment was conducted on the area from which the plant yielded the highest concentration of hydrocyanic acid (0.011%).

For this experiment* two young Holstein cattle were obtained from a herd that had been grazed every forenoon on the vegetation in this reservoir. Food and water were withheld for 14 hours. The animals were then driven into the bed of the reservoir and herded in an area where *Suckleya suckleyana* was the predominating plant. Both animals ate this plant readily and continuously for a period of 3 hours. They were then driven to a water tank in a dry lot where they drank at will. In a period of 2½ hours one animal was observed drinking four times and the other three. During this time no ill effects were noted (table 1). It was then decided to force feed some of the material.

The smaller animal, which weighed approximately 450 pounds, was given about 1 gallon of the finely ground plant by means of a stomach tube. The material was washed down with 2 gallons of water. This animal was carefully observed for 1½ hours, during which time no ill effects were noted. Further observation failed to disclose any subsequent evidence of poisoning in either animal (table 1).

SHEEP

One report previously received led the investigators to suspect that eating *Suckleya suckleyana* may have been the cause of death to a number of sheep and lambs in one flock. In an effort to determine the toxicity of this plant for sheep, two animals were used.

On September 8 a small ewe which had been denied food for 48 hours was confined in a dry lot, and a quantity of *Suckleya*

TABLE 1.—Cattle-feeding experiments with *Suckleya suckleyana.*

| Animal | HCN in plant | Amount eaten voluntarily | Result | Amount force fed | Symptoms appeared | Result |
|---|---|---|---|---|---|---|
| | *Percent* | | | *Gallons* | | |
| 1-550 lbs. | 0.0364 | Little | Negative | 1 | 20 min.; went down in 40 min. | Died in 1 hr., 40 min. |
| 2-600 lbs. | 0.0364 | Little | Negative | 1 | 30 min.; staggered, lay down | Treated: $NaNO_2$ $Na_2S_2O_3$ Recovered |
| 3-450 lbs. | 0.011 | Grazed 3 hrs. | Negative | 1 | Negative | Remained normal |
| 4-600 lbs. | 0.011 | Grazed 3 hrs. | Negative | 0 | None | Remained normal |

*The authors are grateful to Miss Charlotte Schieck, Wiggins, Colo., for her cooperation in obtaining the cattle and furnishing suitable facilities for conducting the experiment.

Figure 5.—Steer used in suckleya-feeding experiments, shortly after falling as a result of poisoning.

*suckleyana* was placed before her. The ewe at first nibbled at a few of the green leaves but refused to eat any appreciable quantity during a period of 48 hours. After the sheep was given a feed of alfalfa hay the experiment was repeated in like manner, with the same results.

On September 18, after food was withheld for 48 hours, a quantity of the plant taken from the Empire Reservoir (0.011% HCN) was finely ground and a quart was given by means of a stomach tube. In 10 minutes after administration the animal appeared restless, muscular incoordination was apparent (fig. 7), and respiration became increasingly difficult. In 20 minutes after force feeding the ewe went down and was unable to stand when raised (figs. 8, 9). The visible mucous membranes at this time were red. The animal become progressively weaker. Occasional spasms occurred, followed by swinging of the legs, muscular twitching, and drawing back of the head. The ewe became comatose (fig. 10) and with occasional spasms remained in that condition for approximately an hour. During this time the respiration was slow and labored, while the pulse was rapid, weak, and irregular. The visible mucous membranes were cyanotic. At the expiration of about 1½ hours from the time the ewe went down, a definite improvement was noted. The breathing became easier, the spasms ceased, and she was able to raise her head. Improvement following this was rapid. In 3 hours the animal was apparently normal and eating alfalfa hay (table 2).

At the same time this experiment was conducted a second

TABLE 2.—Sheep-feeding experiments with *Suckleya suckleyana.*

| Animal | HCN in plant | Amount eaten voluntarily | Result | Amount force fed | Symptoms appeared | Result |
|---|---|---|---|---|---|---|
| | *Percent* | | | *Quarts* | | |
| 1-Small ewe | 0.011 | Very little | Negative | 1 | 10 min.; went down in 20 min. | Recovered |
| 2-Large ewe | 0.011 | Not fed | ..... | 1 | None | Remained normal |
| 2-Large ewe | 0.011 | Not fed | ..... | 1.5 | None | Remained normal |
| 2-Large ewe | 0.011 | Not fed | ..... | 2 | 18 min.; remained standing | Recovered |
| 2-Large ewe | 0.0364 | Not fed | ..... | 1.75 | 6 min.; went down in 8 min. | Died in 30 min. |

and larger ewe was treated in the same manner with the same quantity of *Suckleya suckleyana.* However, this ewe had had access to alfalfa hay and water before the experiment was started. The animal at no time showed any evidence of poisoning (table 2).

In 48 hours, no food having been given the ewe in the meantime, the experiment was repeated in the same manner except that 1½ quarts of the material from the same source was given. Again results were entirely negative (table 2).

On September 21, after fasting for 24 hours, the ewe was given 2 quarts of the same material in like manner. In 18 minutes after the administration of the plant, symptoms of intoxication became evident. Drowsiness was apparent, breathing became slower and deeper, slight muscular incoordination was noted, and the animal leaned with her head against the fence. These symptoms soon passed away, and in about 40 minutes the ewe was apparently normal. It was evident that the *Suckleya suckleyana* from this source was not sufficiently toxic in the amounts given to produce death.

After failing to kill the sheep with the material from this source, a supply of *Suckleya suckleyana* was obtained from the water hole in which the plants showed the highest concentration of hydrocyanic acid (0.0364%). On September 23 the ewe, after being starved 48 hours, was given approximately 1¾ quarts

Figure 6.—Steer used in suckleya-feeding experiments, just before death from poisoning.

of the freshly ground plant by the same method. In 6 minutes breathing became labored, the animal stood with feet apart, and muscular incoordination became increasingly evident until she dropped to the ground in 2 minutes from the time the first symptoms appeared. When raised, the ewe was unable to stand or hold up her head. Fourteen minutes after the plant was administered, a sample of blood drawn from the jugular vein was bright red in color. Respiration became more rapid and shallow, with complete cessation at short intervals during which death appeared imminent. Frequent tonic spasms occurred, followed by swinging the legs and drawing back the head. Fifteen minutes after the ewe went down, the visible mucous membranes became cyanotic. The breathing became more rapid, shallow, and irregular until she died, just 30 minutes after being fed. The heart continued to beat for 2 minutes after respiration ceased (table 2).

Immediately after death a small opening was made into the rumen, and a test for hydrocyanic acid was made (Newsom et al, 1937). Within 5 minutes a strong positive reaction had occurred. An autopsy was performed 2 hours after death. *Rigor mortis* was pronounced. The blood was very dark and only partially clotted. The right ventricle contained some very dark, semi-clotted blood, while the left ventricle was practically empty and contracted. It contained only a trace of dark fluid blood. A slight congestion of the mucous membrane was noted in the initial part of the abomasum. The *Suckleya suckleyana* was present in greatest quantity in the reticulum, with some in the rumen and still less in the omasum and abomasum. During the

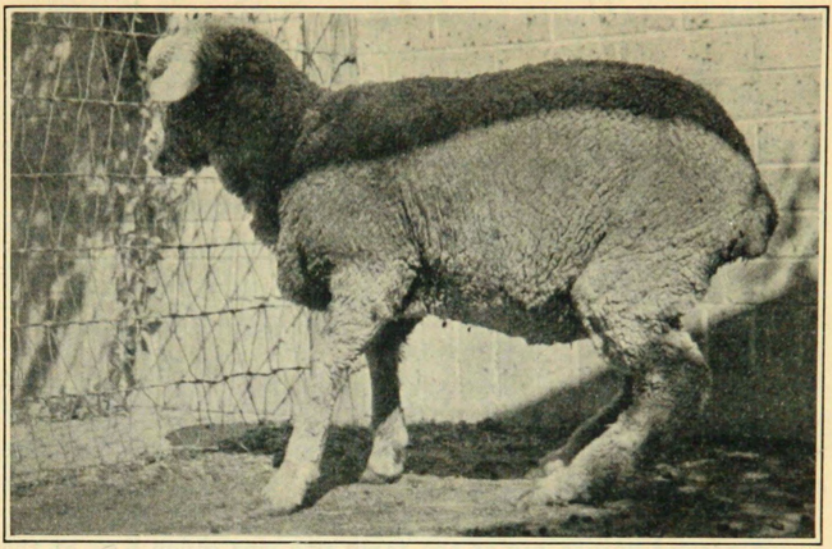

Figure 7.—Beginning of muscular incoordination as a result of poisoning in the case of the smaller ewe fed poison suckleya in experiments.

autopsy some of the rumen contents was sealed in a jar. When tested for hydrocyanic acid 3 hours after death, a weak positive test was recorded.

### RABBITS AND GUINEA PIGS

In addition to demonstrating the toxic effect of *Suckleya suckleyana* for cattle and sheep, it seemed advisable to determine the susceptibility of laboratory animals. For that purpose a quantity of the plant showing the highest concentration of hydrocyanic acid (0.0364%) was finely ground and sufficient water added to completely cover it in a jar. The jar was sealed and placed in the incubator at 37° for 72 hours. Some of the liquid was withdrawn and used for the test.

A three-fourths grown rabbit was given 20 cc of the aqueous extract by means of a stomach tube. In 5 minutes the first symptoms were presented, and the rabbit died 30 minutes later (table 3). The symptoms and course of events were practically identical with those shown by sheep and cattle. On *post-mortem* examination the blood had not clotted and was extremely dark. Pinkish areas were present on the stomach wall, being most pronounced around the cardiac orifice.

A 350 gm guinea pig was given, *per orem*, 10 cc of the

TABLE 3.—Administration of aqueous extracts of *Suckleya suckleyana* to guinea pigs and a rabbit.

| Animal | HCN in plant | Amount of extract | Symptoms appeared | Result |
|---|---|---|---|---|
| | *Percent* | *Cubic centimeters* | *Minutes* | |
| 1-Guinea pig, 350.0 gm. | 0.0364 | 10.0 | 5 | Died in 20 min. |
| 2-Guinea pig, 350.0 gm. | 0.0364 | 5.0 | 5 | Recovered in 30 min. |
| 2-Guinea pig, 350.0 gm. | 0.0364 | 5.0 | 5 | Recovered in 30 min. |
| Rabbit, ¾ grown | 0.0364 | 20.0 | 5 | Died in 30 min. |

aqueous extract of *Suckleya suckleyana*. In 5 minutes the guinea pig showed symptoms similar to those exhibited by the other animals and died in 20 minutes. Autopsy findings were similar to those of the rabbit (table 3).

A second guinea pig of the same size was given 5 cc of the extract. In 5 minutes the guinea pig exhibited symptoms of restlessness and muscular incoordination which were of brief duration. In 30 minutes, when the animal had apparently recovered, the experiment was repeated, using the same quantity of extract. Similar symptoms, somewhat more intensified, were again produced, but a complete recovery followed (table 3).

A quantity of the green plant was placed before each of two guinea pigs, one of which had had no food for 24 hours. Neither ate a sufficient quantity to produce any evidence of intoxication.

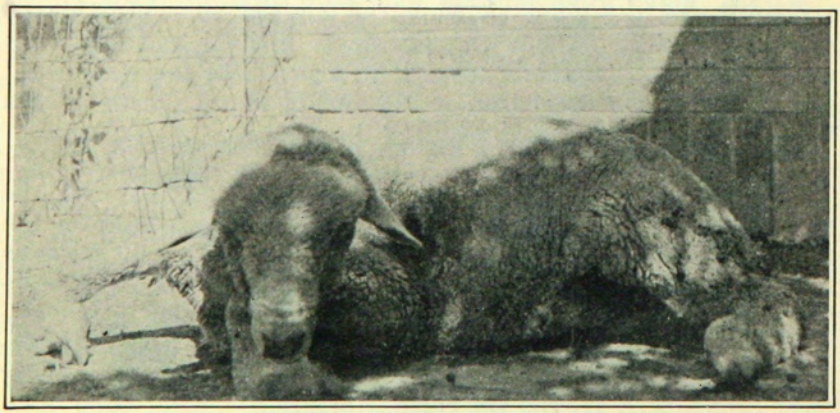

Figure 8.—Ewe used in suckleya-feeding experiments, showing evidence of progressing weakness as a result of poisoning.

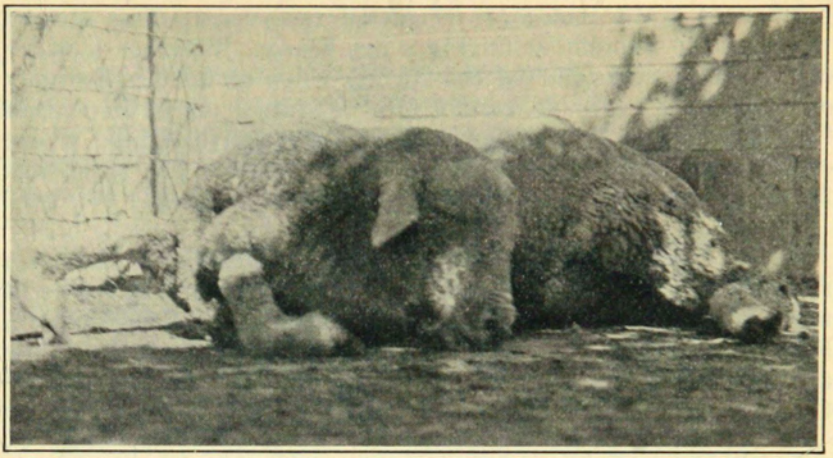

Figure 9.—Ewe used in suckleya-feeding experiments, showing a stage of weakness as a result of poisoning more advanced than that indicated in figure 8.

## DISCUSSION

Field reports indicate the toxicity of *Suckleya suckleyana*, and feeding experiments have proved the plant to be definitely poisonous. Chemical tests, both qualitative and quantitative, have shown it to be cyanogenetic during the late summer and autumn when the observations were made.

Feeding experiments and quantitative analysis have demonstrated a marked variation in the hydrocyanic acid content of specimens taken from various sources. A limited amount of work failed to show a complete correlation between the amount of hydrocyanic acid present and the age of the plant. To what extent other factors such as climatic conditions, moisture supply, character and chemical composition of the soil might influence its toxicity is yet to be determined.

The plants which showed the highest hydrocyanic acid content were taken from areas in which the soil was rich in nitrates. Pinckney (1924) has shown this to be a factor. Limited observations at this station can only suggest this possibility.

In the survey over a small portion of northeastern Colorado, this weed was found growing only in low places where water had previously stood, or below the high-water mark in

permanent water holes or irrigation reservoirs. This survey was made in September during a dry season. Whether a wider distribution occurs during the spring, when an adequate supply of moisture is available, cannot now be stated. As an indication that this may be true, a few instances were investigated where cattle losses had occurred earlier in the season. The plant was found to be entirely dried and difficult to recognize.

The evidence indicates that *Suckleya suckleyana* has been responsible for some of the undiagnosed deaths among cattle in northeastern Colorado this year. The authors are of the opinion, based on previous reports, that this condition has prevailed for a number of years and may have occurred in other sections of the state.

Among the cases investigated, the deaths were almost entirely confined to cows nursing calves. It may be assumed that this was due to a greater consumption of the plant by these cows in a need for a more adequate food supply.

Reported losses have been confined to the dry prairie sections of the state. While a vigorous growth of this plant has been observed in a number of irrigation reservoirs, forage of other types is more abundant in the irrigated regions. This probably results in less of the plant being eaten than in the dry sections. The percentage of hydrocyanic acid was higher among plants found in the plains section than in those found where an adequate supply of moisture was available. This also may be a factor which has seemed to confine the loss exclusively to the dry section.

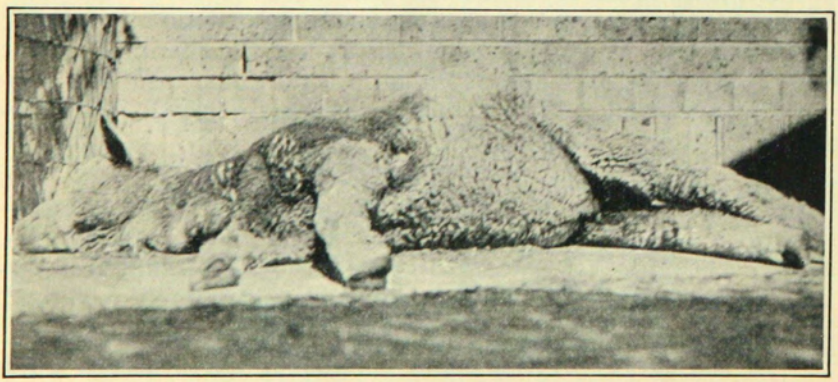

Figure 10.—Ewe used in suckleya-feeding experiments, in comatose condition as a result of poisoning.

## SUMMARY

In making a limited survey of the plains section of northeastern Colorado, *Suckleya suckleyana* was found growing in a number of water holes and irrigation reservoirs. Field evidence would indicate that this plant has been responsible for numerous cattle losses in this section of the state.

*Suckleya suckleyana* has been found by chemical analysis and feeding tests to be cyanogenetic. The qualitative test for hydrocyanic acid was positive for every specimen examined. Quantitative tests showed a variation of hydrocyanic acid concentration from 0.0364 to 0.002 percent as compared with 0.0135 percent contained in a sample of stunted cane.

The *Suckleya suckleyana* which had the highest hydrocyanic acid concentration (0.0364%) proved when force fed to be toxic for cattle, sheep, rabbits, and guinea pigs. Symptoms of intoxication developed rapidly, followed by death or a quick recovery, depending on the quantity administered. The sodium nitrite and sodium thiosulphate treatment brought about rapid recovery in one heifer which showed increasingly progressive symptoms of intoxication induced by artificial feeding.

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