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DELPHINIUM CONSOLIDA IN AMERICA,
WITH A CONSIDERATION OF THE STATUS OF
DELPHINIUM AJACIS.

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FOR at least a century *Delphinium Consolida* held an almost uninterrupted and an unchallenged place in the introduced flora of America.

In 1814 we find Pursh in his *Flora* noting the "common Lark-spur. . . In fields and woods. Pa. and Va." Nuttall in 1818 in his *Genera* regards it as "naturalized." In Eaton's *Manual of Botany*, as early as the Fifth Edition of 1829, it is also considered "Naturalized." Torrey and Gray in 1838 record it "In fields and along roadsides; introduced from Europe and almost naturalized." In the First Edition of Gray's *Manual* in 1848 we find: "D. *Consolida*, the common annual Garden Larkspur . . . has escaped from gardens into the roadsides in some places."

This "common annual Garden Larkspur" appears to have been invariably described as having smooth capsules in our earlier American botanies, a fact very evidently due to a faithful copying and recopying of European descriptions of *Delphinium Consolida*. In 1859, however, Darby described the plant with "Carpels smooth or pubescent"¹ but apparently not till 1890 in Watson and Coulter's Edition of Gray's *Manual* is it recognized that the pubescent-fruited plant escaping from gardens is *Delphinium Ajacis*, a species well known in Europe. From this time *D. Consolida* shared its place in American treatments with *D. Ajacis*.

¹Darby, *Botany of the Southern States*, 207 (1859).

And so through all the standard works, continuing into the First Edition of Britton and Brown's *Illustrated Flora*, the several editions of Britton's *Manual*, Small's *Flora of the Southeastern United States*, Gray's *New Manual*, and many local floras, the right of *Delphinium Consolida* to a place among our introduced plants stood unquestioned, but in 1914 Dr. N. L. Britton in the new edition of the *Illustrated Flora* published this concise statement: "Delphinium Consolida L., a European species which has a glabrous style and capsule, is widely recorded as naturalized in the eastern United States, . . . but all specimens examined prove to be *D. Ajacis*."

A sweeping statement like this, even though from such an authoritative source, always leads one to examine critically the material within his own reach, especially if it has not been a part basis of the original observations. In the present case this was by no means in criticism but for verification, in the regular work of endeavoring to keep somewhat abreast of the botanical times.

The material in the Herbarium of the Academy of Natural Sciences proved, upon the most casual examination, to be without exception *D. Ajacis*. But, to my surprise, in the collection of the Philadelphia Botanical Club two sheets of quite authentic *D. Consolida* were found. The Herbarium of the University of Pennsylvania — well known to hold valuable material supporting old local records — was found to contain two collections of true *D. Consolida*, one being a duplicate of the material already seen in the Philadelphia Botanical Club Herbarium, but the other representing a third and new locality. Search at the Philadelphia College of Pharmacy revealed a fourth collection. After considerable correspondence and much disappointment from both large and small herbaria, a fifth American specimen was found in the herbarium of Mr. E. B. Harger of Connecticut.

From Mr. Harold St. John I have learned that there are no American specimens of the discredited species in the Gray Herbarium. Through the courtesy of Dr. J. M. Greenman the series at the Missouri Botanical Garden has been sent me for examination and I have found it to contain no authentic material of *D. Consolida* from America. From the National Museum at Washington, Mr. Paul C. Standley has written upon my inquiry that after careful examination of their material he was unable to find a single sheet of the species from North America.

Mr. W. W. Eggleston, learning of my search for American *D. Con-*

solida through Mr. Standley, stated that he had seen no United States specimens of this species although he had examined all the material at Cambridge and New York — corroborating Dr. Britton's view and that of Mr. St. John. Mr. Eggleston has been interested in this species (particularly in relation to drug-plant investigations being made by the Department of Agriculture) and on expressing a desire to see the plants which had come to my attention, I sent him the several specimens and have received his verifying determination upon all of them.

To return to this American material of *Delphinium Consolida*:— One of the sheets in the Herbarium of the Philadelphia Botanical Club, collected "on ships ballast below the Pennsylvania Salt Works, Philadelphia" many years ago by that indefatigable ballast-ground specialist, Isaac Burk, is rather of historical interest than of value for the present distribution of the species. The material found at the University of Pennsylvania belongs, certainly in part at least, to the same class. Besides additional specimens of the Burk collection there is material from "Camden, N. J." collected in 1878 by Isaac Martindale. Although actual evidence on the label is lacking, it is in all probability to be associated with the record in Britton's Catalogue of "Camden: On ballast grounds — Martindale."¹ In the Martindale Herbarium at the Philadelphia College of Pharmacy there is a further collection of *D. Consolida* from Camden, New Jersey, made by C. F. Parker in 1882.² Curiously enough there appears to be no material here of Martindale's 1878 collection of the plant, but there are several *earlier* collections of what he took to be *D. Consolida*. (These are however *D. Ajacis*.) Evidently considering he already had the species well represented from Camden in his herbarium, he used this 1878 material for purposes of exchange.

But the second specimen in the collection of the Philadelphia Botanical Club, labelled "Grass field — New Egypt, N. J.," proves to be of some import. The habitat was so definitely suggestive of as real an occurrence in our flora as is shown by *D. Ajacis* that the collector, Mr. J. H. Grove of New Egypt, was communicated with. He wrote that he distinctly remembers collecting the plant in 1907, that he has

¹ Britton, Cat. Pl. N. J. 40 (1889).

² This material — of three specimens showing both flower and mature fruit — is named *Delphinium divaricatum* Ledeb. on Parker's label, and may possibly bear some relation to the reputed occurrence of this species in America.

since seen it a number of times in the same field, most frequent when the field was sown to grain, but that he had not had occasion to visit the locality during the last several years.

The records in the recent *Catalogue of the Flowering Plants and Ferns of Connecticut* have proved in general to have been so carefully compiled that it was felt advisable to investigate the reported occurrence of *D. Consolida* from several localities in that State. Though the records of Dr. E. H. Eames and Mr. Charles H. Bissell proved to be based upon *D. Ajacis*, through the kindness of Mr. E. B. Harger I was able to examine his specimen from Middlebury, Connecticut, and verify it as authentic *D. Consolida*. His plant is from "newly-seeded grass-land." Unfortunately his business that day, as he explains, was not botanical and he had no opportunity to observe fully the occurrence of the species.

As regards both the New Egypt and the Middlebury locality it can not therefore be asserted with confidence what the exact status of the plant is at the present time, but I think it will be agreed the probabilities are that, in the matter of persistence at a locality, this occurrence of *D. Consolida* is quite as worthy of note as a collection of its near ally, *D. Ajacis*. I feel confident that many stations, upon which an American range for *D. Ajacis* has been determined, would be difficult to verify in the field at the present time. I am inclined to think that the occurrence of this species, like many other garden annuals, is largely due to its continual escaping from gardens rather than its ability in actually establishing itself.

Although *Delphinium Ajacis* seems to be tacitly accepted today by the authors of our manuals as a naturalized plant, investigation into this matter would seem to show that its status as such is not based upon too conclusive or convincing grounds. Without doubt there are scattered localities where the species may be more or less well naturalized, but it seems equally clear that only a small percentage of the specimens to be found in herbaria represent actual cases of naturalization — the great majority, merely casual escapes, the collection of which, if not completely destroying the possibility of a permanent colony, has at least often greatly reduced that possibility.

There is a rather general agreement among the Philadelphia collectors who know *D. Ajacis* outside the garden that its occurrence is commonly that of single or few plants on waste ground, roadsides, railroad banks, and that it rarely tends to form a really permanent

station. Dr. John K. Small, however, in his *Flora of Lancaster County* [Pennsylvania] records the plant as "Rather common in fields and waste places" in the central part of the county. A number of specimens collected about Lancaster offer supporting evidence. Mr. E. G. Vanatta, who has made a collection of some size of the more conspicuous plants about Chestertown, Maryland, reports the species as frequent at a locality near the town, in a field and upon the loose gravel of nearby railroad banks. Mr. David McCadden tells me that the plant is common at one place near Norristown, Pennsylvania, along the sides of a railroad-cut.¹ In the Martindale Herbarium is a specimen of *D. Ajacis* bearing the label "Generally in grain fields, Byberry, [Philadelphia]. Frequent 1862."

On the other hand, correspondence and further communication with numerous Philadelphia collectors, has brought forth in general a rather different expression of opinion than the immediately foregoing. Mr. Stewardson Brown, Conservator of the Herbarium of the Philadelphia Academy, assures me that he has never seen *Delphinium Ajacis* except upon very evident dumps, mixed with other plant rubbish that might have been thrown out of a yard in cleaning up. He has never noted it any more established than Garden Petunias and Nasturtiums. Dr. C. D. Fretz, the authority on the plants of Bucks County, Pennsylvania, writes me that the plant is found occasionally along roadsides in Sellersville and other places. He says, further: "I of course consider it very rare. My impression is that it is not at all naturalized, but merely an escape from gardens." Mr. Harold W. Pretz, who has been energetically engaged for a number of years in thoroughly exploring Lehigh County, Pennsylvania, would accredit it with only a spontaneous occurrence "on or in the vicinity of ash piles on comparatively new dumped ground"² and is willing to subscribe to an opinion "that it is not established anywhere in the local region." Mr. Alexander MacElwee, who made extensive collections in the Philadelphia region some years ago and became very familiar with the flora, writes me: "Concerning *Delphinium Ajacis* I would say *decidedly* that it is not a really naturalized plant in our area—in eastern Pennsylvania or New Jersey. I have occasionally found it in

¹ The railroad has been run through a yard and garden, however, and the Larkspur is continually replenished as an escape from the old garden at the top of the cut.

² He makes an interesting suggestion that its behavior would lead one to suspect that it is a plant that depends on newly stirred ground to obtain a footing.

alleys in West Philadelphia, probably originating from old plants which had been thrown over a fence the preceding Fall."

Dr. Witmer Stone, one of the most energetic explorers of southern New Jersey and familiar with many parts of Pennsylvania, recalls having seen only a few roadside plants in Germantown, Philadelphia. Dr. John W. Eckfeldt records a couple of plants with Alfalfa used as a binder on the railroad banks below Haddonfield, New Jersey. Dr. Arthur Jones recalls the plant in some of the old towns of southern New Jersey but always as a rare garden escape or upon dumping grounds.

Professor W. A. Kline of Ursinus College, who is familiar with the Parkiomen Valley, considers it a very rare plant of roadsides or dumps. Mr. Joseph Crawford notes a rare occurrence on dumps and waste ground, often due to the thrown out dead plants of the previous year. Mr. W. H. Leibelsperger, working in Berks County, Pennsylvania, records the species as very rare along roadsides.¹ None of these observers have ever seen the plant anywhere actually naturalized.

Dr. J. M. MacFarlane and Dr. John W. Harshberger of the University of Pennsylvania, both of whom have had wide field experience in the local area, are in agreement that this is a plant never straying far, in their experience, from its source in cultivation, or becoming independently established.

Not merely the mechanical difficulties of endeavoring to obtain reports from collectors all over the eastern United States have led me to confine this expression of opinion to collectors from the Philadelphia region, but the fact that this area lies midway in the eastern range accorded the species would seem to offer a fair mean of conditions. As a suggestion of the probable verity of this, of the three collectors reporting the plant in the Connecticut Catalogue, Dr. Eames writes me: "In regard to *D. Ajacis* being really naturalized in any case would say that it persisted for many years about a garden in Bridgeport. In one other instance it appeared to be thoroughly naturalized along a roadside, upon ledges in thin, rather dry soil, and in an adjoining field in Weston, Connecticut, when seen some years ago — a station, however, but little more than a stone's throw from an old house, although in land not under cultivation in recent years,

¹ Mr. Leibelsperger, in correspondence, speaks of this, or another species, occurring in grain-fields in his vicinity. It is rather confidently expected that this will prove to be *D. Consolidida*, but specimen evidence is unfortunately not available at this writing.

or in large part a natural sterile waste"; while Mr. Bissell says boldly that he does not know it as a good escape or persisting; and Mr. Harger characterizes it as "a fugitive garden escape" which he has seen only by roadsides. It would seem probable that the same general opinion obtains in Connecticut as in the Philadelphia area. From the Eastern Shore of Maryland — to turn in the opposite direction — Rev. J. P. Otis, while noting that a *Delphinium* has for several seasons been apparently taking care of itself in a door yard and the adjoining truck-patch in the village of Sharptown, writes that his observations are in agreement with those of the Philadelphia botanists. May there be added this last evidence — which almost exactly voices my own — that of Mr. W. W. Eggleston: "My own personal experience with *D. Ajacis* in the field is very limited, never having collected it more than two or three times. It has always been as a chance seedling."

If an opinion from the Philadelphia area may be taken as typical for the eastern United States, it will be agreed that *D. Ajacis* must be recognized as one of the weaker elements of our flora. But whatever its actual status it is to be recognized among our notable garden escapes, though the fact of its thorough naturalization would seem to be still open to some question.

There are comparatively few statements in the more recent local floras, even when the two species are distinguished, which can be taken at their full value in searching for information on the frequency of *D. Ajacis*. The statement in *The Plant Life of Maryland* that *D. Ajacis* is "infrequent" appears hopeful till it is balanced with *D. Consolida* occurring "Throughout the state . . . common." There are so many general statements of state-wide frequency in this volume that one cannot but suspect that tradition is in large measure responsible rather than accurate observations. It is of interest to note that in the *Catalogue of the Flowering Plants and Ferns of Connecticut*, where statements on distribution are commonly found so credible, the species is reported as "Rare. Escaped from gardens into waste land and fields," only four stations being noted, and it is said to be "Adventive from Europe" rather than credited with the usual phrase, "Naturalized from Europe." Mr. Norman Taylor's statement in his *Flora of the Vicinity of New York* (which includes most of the Philadelphia area) — "An escape from cultivation throughout the range" — is rather noncommittal as to the extent of naturalization shown by the species, but it is to be strongly recommended as being less open to criticism than the average opinion found in manuals and floras.

Delphinium Consolida — to return to this species — is well known in Europe as a weed in grain fields. Bentham¹ succinctly describes it as "A common weed of cultivation" and definitely speaks of it appearing in corn fields in certain parts of England. It is of interest that the source of *D. Consolida* at New Egypt was, as Mr. Grove observes, apparently not gardens but seed in grain.² It was particularly gratifying to find that Mr. Harger's *D. consolida* was from "newly-seeded grass-land." He says that it occurred to him at the time that it was introduced with grass seed, although, on consideration, the size of the seed might lead one to doubt this. So many seeds, of varying sizes, are so well known as occurring in bad grass seed that I think it may be safely asserted that the mode of introduction of the Middlebury *D. Consolida* was quite similar to that at New Egypt.

I have been able to find practically no complete and satisfactory evidence of *D. Ajacis* occurring in grain- or grass-fields. Moreover, I am under the impression that the annual Larkspur commonly seen in gardens is *D. Ajacis*, rarely, if ever, the generally fewer-, smaller-flowered *D. Consolida*. If this is correct, there is a possibility that the source of *D. Consolida* may be very different from that of its near ally, and it may prove to be a field weed here in America as in other countries, rather than a garden escape, as has been suggested by Taylor in the *Flora of the Vicinity of New York*. Further evidence is to be desired at any rate that *D. Ajacis* is to be found as a weed of grain- or grass-fields.³ The Philadelphia testimony points to this reputed occurrence as being traditional rather than actual. No doubt this has been in some measure due to the statement in European botanies concerning *D. Consolida*.

Though the present noted occurrence of *D. Consolida* may not be considered by some as sufficient evidence for the inclusion again of this species in our flora, it is at least suggestive that here is an opportunity for further field observations before the species is finally dis-

¹ Bentham, Handbook of the British Flora, 22 (1865).

² In this connection it is to be noted that as early as 1814 Pursh (Fl. Am. Sept. ii. 372) regards *D. Consolida* as "probably introduced with the seed of grain from Europe." It would seem impossible to decide, however, whether he really had the true *D. Consolida* here in America, or was merely led to this opinion by a knowledge of the occurrence and habitat of the species in Europe.

³ Darlington, in the Third Edition of the classical *Flora Cestrica*, under "*Delphinium Consolida*," makes these interesting observations: "This introduced plant is usually to be met with in gardens; and occasionally finds its way into the grain fields of thoughtless people who are in the practice of carrying garden-rubbish into the barn-yard. In such cases it threatens to become a nuisance."

credited to our area. I do not doubt but that many of the rarer introductions holding places in our manuals rest upon as little, or even less, conclusive evidence than that given by *Delphinium Consolida*. One need look no further than among the near allies to find some pertinent cases — for example, *Adonis autumnalis* and *Nigella Damascena*. *Eranthis hyemalis*, for long years holding a traditional but undisputed place in our American flora because naturalized at Bartram's Garden, Philadelphia and in Painters' Arboretum, near Media, Pennsylvania, is distinctly not above suspicion.

It is to be hoped that those who may feel that *D. Consolida* has not been shown eligible to a place in our manuals will also feel constrained to bring critical attention to bear upon the status of *D. Ajacis*.

ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA.

SOME NOTES ON SPARTINA.

M. L. FERNALD.

IN checking the species of *Spartina* in northeastern America the writer has been surprised to note the recent treatments in the manuals of eastern North America of the coarse smooth salt marsh species. Hitchcock, in the 7th edition of Gray's Manual, following Merrill,¹ treats it as *S. glabra* Muhl., with vars. *pilosa* Merrill and *alterniflora* (Loisel.) Merrill; while Nash, in the 2d edition of Britton & Brown's Illustrated Flora, treats it as *S. stricta* (Ait.) Roth. In the 1st edition of Britton & Brown, Nash, following Gray,² had treated the American plants as *S. stricta* with two varieties, though he had added the luminous note, "Our plant does not appear to be satisfactorily identified with the European,"³; but in the 2d edition, the varieties have been omitted and with them the clarifying note, and all the American plants reduced outright to the European *S. stricta*. Examination of the European plant, however, shows *S. stricta* to differ from all the material from eastern America not only in the very pilose lemmas emphasized

¹ Merrill, U. S. Dept. Agric. Bur. Pl. Ind. Bull. no. 9, 8 (1902).

² Gray, Man. ed. 2, 552 (1856).

³ Nash in Britton & Brown, Ill. Fl. i. 177 (1896).