

EXPLORING SOUTH-EAST BRAZILIAN WILD CAPSICUM.

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Abstract

A large number of little-known species of wild *Capsicum* grow in South-East Brazil.

Claudio Dal Zovo, one of the authors, made four trips (together with other Italian keens on *Capsicum* in 2011-2012, alone in 2013) to locate populations of these species, observe them in the wild, describe their morphological characteristics, gather a complete photographic documentation and report about the current situation.

The search for wild *Capsicum* in their habitat revealed interesting aspects.

Few species are clearly differentiated on the basis of their morphology and habitat.

Some populations found in different sites and classified as distinct species show minor differences and therefore could be ecotypes belonging to the same species, with differences caused by environmental conditions.

In other cases there are significant differences between populations assigned to the same species.

Some species are widespread, others restricted to limited areas, but represented by large populations.

However, some species are represented by extremely small populations, sometimes only a few individuals; they could disappear in a short time.

Our experience highlights the need to develop criteria for a more precise identification of the species.

It seems also necessary to protect some populations before they are lost forever, also through their ex-situ cultivation.

The possibility of using these wild species as a source of useful genes for cultivated species should be also evaluated, in order to add resistance to diseases and adverse weather conditions.

Keywords: *Wild Capsicum South-East Brazil Classification Protection Breeding*

Introduction

The wild species of the genus *Capsicum* grow in Center and South America.

South-East Brazil hosts about 10 little-known species, concentrated in a relatively small area.

Many species from the Central America and Andean region are well-known, since they are available through the seeds banks and are grown by chile peppers enthusiasts around the world.

The species of the South East Brazil were instead almost completely unknown; only few botanists had the chance to locate and study them in their natural habitat.

These species are unknown also to Brazilian people that don't use them in any way.

Claudio Dal Zovo, one of the authors, wished to know more, so he decided to visit Brazil, together with other Italian keens on wild *Capsicum*, to locate populations, describe them through photographic documentation and morphological characterization and report about the current situation.

Data here reported are based on the point of view of the authors and may differ from the ones of other participants to the mission.

Materials and Methods

A meticulous preparatory work was carried out by examining almost all the available literature, searching herbaria sheets of Embrapa [13] and exchanging information with Brazilian and Argentinian botanists.

We chose the months of Brazilian late Summer/Autumn (late February-early June) in order to

obtain the highest chance to find both open flowers and ripe berries.

Four explorations were performed; two people participated to the first and second ones, four to the third one; Claudio Dal Zovo made a fourth trip alone.

The Argentinian botanist Carolina Carrizo García joined the group in the last two days of the third trip.

During the first trip (late February 2011) we visited the area North-East of São Paulo: Salesópolis (Casagrande), Caraguatatuba (Rodovia dos Tamoios), São Luís do Paraitinga, Cunha (Pedra da Macela, road to Paraty), Lima Duarte (Park of Ibitipoca), Bertioga, Cubatão.

During the second trip (early June 2011) we explored the area North of Rio de Janeiro: Nova Friburgo (Pico da Caledonia), Castelo (Caxixe), Viçosa, Teresópolis (Parque dos Orgãos).

During the third trip (late April-early May 2012) we expanded the search to the South and North, from Curitiba to Belo Horizonte, and visited Paranapiacaba (Reserva Biológica do Alto da Serra), Salesópolis (Estação Biológica de Boracéia), Campos do Jordão (Park and Lefèvre Station), Monteiro Lobato, Maria da Fé, Piquete, Petrópolis, Caraça (Park of the Sanctuary), São Miguel Arcanjo (Parque Botelho), Morretes (Estrada da Graciosa).

During the fourth trip was thorough the exploration of many sites already visited previously, including Boracéia and Paranapiacaba, and were visited new sites such as Caminho do Imperador (Petropolis), Morro da TV (Nova Friburgo), Estrada do Sertão (Bananal), Estrada Resende-Caxambù, Estrada Cunha-Paraty (full path) and other.

Historical sites of findings and other promising areas, including many natural parks, were explored.

Results

During the trips we found out and documented populations or individuals of known species and yet unclassified accessions, which are identified by the collector codes and the provisional names (*Capsicum* sp. followed by a progressive number) assigned during an exploration conducted by Brazilian botanists in 1999 [5].

<i>Capsicum villosum</i> Sendtn.	
<i>Capsicum villosum</i> Sendtn. var. <i>muticum</i> Sendtn.	
<i>Capsicum schottianum</i> Sendtn.	
<i>Capsicum cornutum</i> (Hiern) Hunz.	LBB1542, LBB1546, LBB1547
<i>Capsicum dusenii</i> Bitter	
<i>Capsicum pereirae</i> Barboza & Bianchetti	
<i>Capsicum friburgense</i> Bianchetti & Barboza	
<i>Capsicum hunzikerianum</i> Barboza & Bianchetti	
<i>Capsicum buforum</i> Hunz.	LBB1550, LBB1551
<i>Capsicum recurvatum</i> Witas.	<i>Capsicum</i> sp.1, LBB1520, LBB1521
<i>Capsicum</i> sp.6	LBB1559, LBB1564, LBB1556
<i>Capsicum</i> sp.9	LBB1569

We also found out two populations of uncertain classification, similar to *C.recurvatum* and *Capsicum flexuosum* Sendtn.

We also observed cultivated plants of *Capsicum parvifolium* Sendtn., now re-classified as *Capsicum caatingae* Barboza & Agra, and many plants of quite common species such as *Capsicum praetermissum* Heiser & Smith and *Capsicum baccatum* L. var. *baccatum*.

All the black-seeded South-Eastern species have common features (except *C.flexuosum*).

The number of chromosomes is 26 (2n=2x) (not verified in *C.hunzikerianum*).

The typical habitat of the wild *Capsicum* spp. is the “Mata Atlantica”, the forest which covers the mountains along the South-East Atlantic coast of Brazil.

All the species live at quite high altitudes, with a few exceptions, from a minimum of 500 m asl up

to a maximum of almost 2000 m asl.

The plants prefer the transition zones between light and shadow; they grow mainly at the edges of roads and trails or at the limits of clearings (with the exception of *C.pereirae*).

The plants have shrub or small tree habit with long branches and vigorous suckers and sprouts.

The height of adult plants varies from 50-60 cm up to over 3 m, but we found out also plants with creeping stems several meters long and suckers up to 3 m in height.

The leaves along the branches are often in pairs with one leaf larger than the other.

Plants are covered by mono-pluricellular trichomes; some species are almost glabrous, other very pubescent; populations characterized by the presence of glandular trichomes were observed.

The flowers are usually multiple per node, erect and geniculate at anthesis.

The corolla in most cases is stellate, white with greenish/yellowish spots in the throat and purplish red spots in the petals lobes.

Fruits are small and roundish, as large as a pea, pendulous and deciduous when ripe.

Fruits of all the species are pungent, except in *C.dusenii*; they are quite hot when immature, less hot, sweet and juicy after ripening; the final color is greenish yellow, almost translucent.

Seeds are black, very coriaceous.

The morphological characters distinguishing the different species or botanical varieties are the position of the flower at anthesis, the corolla colours, the presence of teeth in the calyx, the pubescence and (in some cases) the trichomes type.

C.villosum is widespread and has homogeneous traits in all the identified populations; plant is wholly covered with trichomes; calyx has 5 long teeth; flower is erect and geniculate at anthesis; corolla is white with greenish/yellowish spots in the throat and purplish red spots in the lobes.

C.villosum var. *muticum* share the same characteristics of *C.villosum*, but calyx is toothless.

C.schottianum is also widespread, with significant morphological differences from area to area; plants often grow to huge size (over 3 m); trichomes are scarce; calyx is toothless or with tiny teeth; flower is erect and geniculate at anthesis; corolla is white with greenish or yellowish spots in the throat and the lobes, sometimes with purplish red spots in the distal part of the lobes.

C.cornutum shows a great variability in the corolla color, with greenish, yellowish or brownish spots; in some populations corolla is entirely white; flower is erect and geniculate at anthesis; calyx has 10 teeth (sometimes from 5 to 9) of different size; plants are scarcely pubescent.

C.dusenii is very pubescent; flower is erect and geniculate at anthesis; corolla is slightly campanulate with purplish/brownish spots; calyx has 10 long teeth of the same length.

Fruits are not pungent. [3]

C.pereirae grows in a very special and narrow habitat in the relatively arid Park of Ibitipoca, two "grutas humiditas" with scarce natural light and very high humidity.

Plant is glabrous with coriaceous leaves; calyx is toothless; flower is pendulous; corolla has greenish or yellowish spots in the throat and purplish red spots in the lobes.

C.friburgense is undoubtedly a unique species; plant is scarcely pubescent; flower is erect and geniculate at anthesis; calyx has 5 teeth, not always well-developed; corolla is unique among all *Capsicum*, campanulate urceolate, entirely lilac-fuchsia.

Fruits are light green when immature, dark green when ripe (not yellowish as in other species).

The species grows in a very narrow area near Nova Friburgo, at high altitude (1750 m).

C.hunzikerianum is very distinct from the others; it grows in marshy places in a very misty habitat in a narrow area in the Estação Biológica de Boracéia.

Plant is glabrous, with nodes and young branches violaceous and coriaceous leaves; calyx has 5 evident teeth; fruit is larger than in other species; flower is erect not geniculate; corolla is large, with greenish/yellowish spots in the throat and purplish red spots in the lobes.

C.buforum grows near Campos do Jordão, inside the Park and (few plants) near the railway station E.Lefèvre. Plant is scarcely pubescent; calyx has 5 evident teeth; flower is erect and geniculate at anthesis; corolla has greenish/yellowish spots in the throat, purplish red spots in the lobes, visible in

the back of petals.

Some populations growing South of São Paulo could be classified as *C.recurvatum*, e.g. *C.sp.1* LBB1520 and LBB1521 in the Park Botelho and another population along the Estrada da Graciosa. Flower has greenish/yellowish spots; calyx bears 5-9 teeth curved backward, sometimes reduced or barely visible. A population found at Paranapiacaba, inside the Reserve and in the neighbourhood, has similar features.

Capsicum sp.6 includes populations with similar traits, i.e. calyx with 5 teeth and corolla with clear purplish red spots in the lobes.

C. sp.6 LBB1559 is an accession found along the road to the Park of Ibitipoca; plant is scarcely pubescent; flower is erect and geniculate at anthesis; calyx has 5 teeth variable in length (sometimes reduced); corolla is characterized by purplish red spots very evident and sometimes spread throughout the petals.

C. sp.6 LBB1556 grows near Piquete; it is similar to the previous one, but with more marked purplish red spots which often are also visible in the back of the petals.

C. sp.6 LBB1564 grows in a narrow area at high altitude in the Parque dos Orgãos.

Plant is scarcely pubescent; flower is erect or intermediate, geniculate at anthesis; calyx has 5 fleshy teeth; corolla is slightly campanulate; the back of the petals and the buds are violaceous.

Capsicum sp.9 LBB1569 grows at Caraça and it is characterized by linear leaves, up to 20 cm long and less than 2 cm wide.

Plant is quite pubescent, with mono-pluricellular thricomes; calyx has 5 well-formed teeth, sometimes with additional shorter teeth.

Flower is variable in size, very large (up to twice the size of flowers of other wild species), erect or, more often, intermediate, geniculate at anthesis, with greenish/yellowish spots reduced and purplish red spots very evident in the lobes. Fruits are quite large and slightly irregularly shaped.

C.flexuosum is a species with 24 chromosomes spread in Paraguay and North Argentina, but some populations were also found near São Paulo.

The population of Monteiro Lobato is very similar to *C.flexuosum* (coriaceous leaves, red ripe fruits), but differs in the presence of purplish red spots in the corolla lobes.

C.caatingae is a species with 24 ($2n=2x$) chromosomes typical of Central Brazil arid biomes, but two plants are grown by Prof. Casali at the University of Viçosa.

Plants are impressive, formed by a large array of stems; leaves are glabrous; flowers and fruits form fascicles up to 15-20; immature fruits are greenish, ripe fruits are yellowish; seeds are straw/brownish; flower is pendulous not geniculate; corolla shows a sequence of 5 colors, light green in the throat, yellow, dark violet, violet and finally white in the lobes.

C.praetermissum is widespread; corolla is stellate or rotate with various colors and shapes; four plants with four different corolla shapes were present in a flower-bed at Biritiba Mirim.

C.baccatum var. *baccatum* is also rather widespread; corolla is rotate with yellow spots in the lobes. We didn't find any population of *Capsicum campylopodium* Sendtn., although this species is reported to be rather common.

Discussion

The search for wild *Capsicum* in their habitat revealed interesting aspects.

Species differentiation.

Few species are clearly differentiated on the basis of their morphology and habitat.

C.hunzikerianum is very different from all the other species in its habit and habitat, its leaves, flowers, fruits and lack of pubescence.

C.friburgense is unique for the shape and color of its corolla.

C.dusenii is well-differentiated for its flower, the dense pubescence, the calyx with 10 teeth of the same length and above all for the lack of pungency.

C.villosum is immediately recognizable for the very dense pubescence.

The population of *C.pereirae* which grows at Ibitipoca is well-differentiated for its habitat, the flower pendulous not geniculate, the leaves coriaceous.

Capsicum sp.9 of Caraça is unique for the linear leaves and the size of its flowers.

This accession has no name yet; in some features it is similar to *Capsicum mirabile* Mart. described in Flora Brasiliensis [1], especially for the leaf shape, but it differs for other traits, such as pubescence and growing area. Possibly it represents a species not yet classified, also in consideration of its geographical isolation from other *Capsicum* populations.

Uncertainties in the classification (Groups of species or populations with classification issues).

Some populations found in different sites and classified as distinct species show minor differences.

It is thus possible that these populations are actually ecotypes belonging to the same species with differences caused by environmental conditions.

In other cases there are significant differences between populations assigned to the same species; we could observe a great variability in morphological traits such as corolla color and shape, number, length and shape of calyx teeth.

These traits vary even within the same population, especially when it consists of many individuals (e.g. *C.recurvatum* at Park Botelho) or when populations grow in different climatic and soil conditions.

This peculiarity makes difficult in many cases to establish clear boundaries and determine to which species belongs a certain population.

Notwithstanding it's possible to identify some groups with common features.

The group of *C.cornutum* includes populations characterized by the calyx with 10 teeth (sometimes 5 inconspicuous), but different corolla colors, with green or yellow spots (Serra do Mar) or completely white (accessions LBB1547 at Cunha and the plant (accession 461-462, 1986) on the road Cunha-Paraty close to the state limit SP-RJ).

The accession LBB1546 (at lower altitude on the same road) has corolla with golden spots; fruits may occasionally show only 5 teeth.

Corolla colors of accession LBB1542 at Casagrande are unknown.

This is a heterogenous group which could include several species.

It is curious that populations growing close each other in the area between Cunha and Paraty share several characteristics, but differs in other morphological traits; populations with white corolla and 5 teeth, white corolla and 10 teeth, golden-spotted corolla and 10 teeth were found.

The pubescence is also variable.

Morphological differences with *C.dusenii* are clear, especially the presence/absence of pungency, even if some botanists consider *C.cornutum* synonymous of *C.dusenii*.

C.dusenii also differs from other *Capsicum* because it only seems to set up flowers and fruits very early in spring (so it was not possible to find open flowers).

Another group includes populations with 5 teeth in the calyx, corolla with greenish/yellowish spots in the throat and purplish red in the lobes, scarce pubescence; *C.buforum* and various populations identified as *Capsicum* sp.6 belong to this group.

Some experts think that these populations match *C.mirabile* described in Flora Brasiliensis [1], but the recent literature contains conflicting indications on the name to use, *C.buforum* or *C.mirabile*.

Despite the common features, there are obvious differences and a great variability, even in the same population.

The population of Lefèvre and Campos do Jordão fit the definition of *C.buforum* given by Hunziker in 1969 [2] and grow very close to the original site.

The population of Orgãos is very similar to the previous one and well recognizable from others, but has some peculiarity, especially in the intensity of corolla and buds colors.

In the population of Piquete the purplish red color in the corolla fills almost entirely the lobes and is variable from plant to plant; it's often also well visible on the back of the petals.

The population of Ibitipoca also shows a great variability in the intensity of the purplish red

component of the corolla and in the teeth length; at first sight we thought that *C.sp.6* shared the same area with a population of *C.schottianum*.

The group of *C.recurvatum* spread in the area at South and East of São Paulo (Parque Botelho, Morretes, Paranapiacaba) presents great variability in the shape, orientation, number and length of the teeth; sometimes they are well-formed and curved backwards, in other cases reduced or almost absent, even in plants growing side by side. Corolla has greenish/yellowish or pure green spots.

The group of *C.schottianum* includes populations with calyx toothless and corolla with greenish/yellowish spots, sometimes with more or less obvious purplish red component which may be absent or present even in flowers from the same plant at different times.

Calyx has 5 nervatures which sometimes originate small teeth.

The difference between *C.schottianum* with small teeth and *C.recurvatum* with reduced teeth is minimal; some populations, for example those at Paranapiacaba (in the Reserve and near the railway station) could be included interchangeably in both groups.

C.campylopodium could also be part of the *C.schottianum* group.

The distinguishing characters of this species are corolla with yellow spots, androecium heterodynamous with 3 short stamens and 2 long stamens, fruit compressed laterally, toothless calyx. These differences are quite vague because one or more of the same characteristics may be detected even on *C.schottianum* or other species.

Stamens of different length were documented in *Capsicum lanceolatum* (Greenm.) Morton & Standley, *C.pereirae* and *C. sp.9* of Caraça, but it's a temporary phenomenon caused by a different speed of maturation of the anthers after the flowering; it's possible that this phenomenon occurs even on *C.schottianum*, although not observed. The lateral compression of the fruits is caused by a peculiar arrangement of a group of 4 seeds, 2 per locule; the same peculiarity is frequent in *C.schottianum* too, but not on all the fruits of the same plant.

It is interesting to highlight that the areas where *C.campylopodium* was found in the past are almost always overlapped to those of *C.schottianum* and that, despite our extensive exploration, we never found plants identifiable certainly as this species, even if it should be widespread.

A single small plant of *C.villosum* var *muticum*, morphologically very similar to *C.villosum* (especially for the dense pubescence) was found; however it showed two important differences, the lack of teeth in the calyx (hence the name *muticum* of the variety) and above all the corolla with greenish/yellowish spots, but purplish red component absent or very limited.

The peculiar color could be due to the growing conditions, but it should be noted that *C.villosum* presents a great homogeneity in the corolla colors, even in populations growing far apart each other; the purplish red spots are always present and intense.

Purplish red spots are described in literature for *C.villosum* var. *muticum* [13], so the plant we found could be an exception; further investigations are needed.

Two populations of *C.pereirae* in two far apart areas and different habitat share common features such as pendulous and not geniculate flower and toothless calyx.

At Ibitipoca the species grows in two distinct sites, but shows homogeneous characteristics.

The habitat ("gruta humida") is the most peculiar among all those visited, a kind of oasis in the middle of an arid Park, with very scarce natural light and high humidity.

The populations of Castelo live in a very different habitat, the typical Mata Atlantica.

A careful observation of the few photographs in the paper where the species was at first described [8] highlights that the corolla colors and other features are variable; in one photograph a flower shows different colors and shape and in the background there is another flower clearly geniculate.

C.caatingae is a case unto itself. When we saw this species, it was still classified as *C.parvifolium*, but when we carefully observed its characteristics, it soon became clear that it didn't correspond to *C.parvifolium* described in Flora brasiliensis [1], especially for the absence of teeth in the calyx.

We also noticed a feature yet not highlighted in literature, the annular constriction, more evident in mature fruits.

The classification was clarified in a paper published shortly after [12]; the plants cultivated at

Viçosa are just a new species, *C.caatingae*. The paper accurately describes also the “true” *C.parvifolium* and a third, new species of arid biomes characterized by very long teeth in the calyx, trichomes of various type and absence of pungency: *Capsicum longidentatum* Agra & Barboza.

Features of fruits and seeds.

The features of fruits and seeds suggest that the main dispersors are small mammals which gather the fruits fallen on the ground. The higher pungency in the immature fruits could encourage the consumption of only ripe fruits and deter any attempts to collect immature ones. Tough seeds could be an adaptation to pass without damage through the digestive system of small mammals and rodents.

However, there aren't studies on fruits predation and seeds dispersion for these species.

It is not even clear what are the pollinators; insects in proximity of the flowers were never observed.

Distribution of species and risk of extinction.

Some species are widespread (*C.schottianum*, *C.villosum*).

Others live in small areas, but with large populations; the population of *C.recurvatum* in the Parque Botelho extends along a dirt road for over 20 km.

However, there are species with extremely small populations (in the visited sites), sometimes only a few individuals in a narrow area.

We found a dozen plants of *C.hunzikerianum*, only half of which were adult.

Approximately 20 plants of *C.friburgense* are present in an area less than 1000 m² wide; only one of the three populations originally described at different altitudes is still present and the plants found near the road were recently cut and re-sprouted.

The site seems to be used as pasture for cows.

Only a single plant which could be *C.friburgense* was found (during the fourth trip) in another site where a population was present in 1986; however the plant had no flowers and only few fruits with 5 small teeth, so identification is uncertain; in the same place also plants of *C.schottianum* were present.

Only a few plants of *C.pereirae* are present at Ibitipoca, fortunately in a well-preserved habitat.

The species seems to have disappeared from one of its original sites, the area near Castelo, subject to a rapid development and intensification of agriculture.

C.villosum var. *muticum* was not found in one of its historical sites, only a single small plant was found nearby in a quite risky situation.

Only a single plant (without flowers and fruits) was found along the road Resende-Caxambú (verificar), where *C.villosum* was common in 1999.

No wild *Capsicum* was found along the Estrada do Sertão near Bananal and the current situation doesn't seem suitable for their growth.

The situation of *Capsicum* sp.9 at Caraça is critical; we found out only one single adult plant and a few seedlings in a cut underbrush; other populations might grow in other sites, inside the Park, but so far there are no reports of other findings.

Single adults plants can often be found at roadside, just outside the area cut for maintenance, but the small “mudas” are steadily cut.

The destruction of the habitat is not the only risk; another critical factor is the difficulty of reproduction in some populations.

In some cases very old isolated plants were found, without “mudas” nearby. An emblematic case is the plant of *C.cornutum* with white corolla found along the road Cunha-Paraty in 2011; the plant grows in the exact place where a single plant with the same features was found in 1986 and looks old enough to be the same plant; there aren't other *Capsicum* plants for kilometers all around.

During the fourth trip a different situation was observed; the old plant was cutted and resprouted; another young plant was found nearby.

Even if there may be undetected populations or interesting areas still unexplored, some species

could disappear in a short time; it seems necessary to protect some populations at risk, even growing them ex-situ.

Exploration of sites not mentioned in literature led in many cases to find out populations or single plants, but always belonging to the most common species (*C.villosum* and *C.schottianum*).

A systematic exploration of promising areas could lead to find out new populations or perhaps new species; the recent classification of well-differentiated species (*C.pereirae*, *C.friburgense*, *C.hunzikerianum* [8]) demonstrates that there is still much to discover.

Up to now populations were found especially along roads and tracks (with the exception of *C.pereirae* and *C.hunzikerianum*)

Determining the habitat of these species in the pristine Mata Atlantica could help to find new populations.

Classification criteria.

Our experience highlights the need to develop criteria to more precisely determine different species. It would be necessary to define which morphological criteria are definitely relevant to differentiate the species as a great variability on the corolla colors and leaves shape can be observed, even in the same species or populations, while the presence and number of teeth and the pubescence seem to be relatively constant.

Field observations suggest that corolla colors and its shape (more or less open), the size of calyx teeth and the size and proportions of the leaves are strongly depending on the exposure to the sun and on the growing conditions and may vary from individual to individual in the same population; thus these characters aren't always useful parameters to differentiate these species.

Growing these species in a controlled environment could reduce environmental influence.

Presumably DNA-based assessment might solve many doubts.

Interspecific breeding could also give information on possible crossing and species differentiation.

In literature only one attempt to use South East Brazilian wild Capsicum in interspecific crosses has been documented [7], but not with other species from the same area.

In nature interspecific crosses between these species are not known and we never found plants with intermediate features in sites where populations of different species grow side by side, e.g. *C.villosum* and *C.schottianum*.

Breeding.

The possibility of using these wild species as a source of useful genes for cultivated species should be evaluated, in order to add resistance to diseases and adverse weather conditions.

First step is the determination of potentially useful genetic traits.

It is possible that these species are particularly resistant.

For example, a simple experiment carried out by Claudio Dal Zovo in Italy on *C.flexuosum* (plants from seeds distributed by the USDA genebank) demonstrate without any doubts that this species is frost resistant. Plants survived two winters outdoor (in pots), with temperatures down to -12°C.

The investigation of the possible use in breeding should consider that all these wild species are 26n (except *C.flexuosum*) and therefore are not easily hybridizable with the cultivated species.

Tong and Bosland reported [7] an attempt to hybridize *C.buforum* with 9 cultivated and wild species (*C.praetermissum*, *Capsicum cardenasii* Heiser & Smith, *Capsicum eximium* Hunz., *C.lanceolatum*, *Capsicum tovarii* Eshbaugh, Smith & Nickrent). The results of interspecific hybridizations showed varying degrees of compatibility, but no viable hybrid seeds were produced.

Gábor Csilléry, one of the authors, deeply studied interspecific crosses using wild species [4], but none from South-East Brazil; however, his experience could be very useful.

A good starting point to investigate interspecific crosses could be *C.flexuosum* x *C.baccatum* L., because *C.flexuosum* is a 24n species and should be quite similar to *C.baccatum*.

In cooperation with Brazilian Institutions and in accordance with the International Conventions on Biodiversity Conservation, these species should be grown and studied, before they disappear!

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