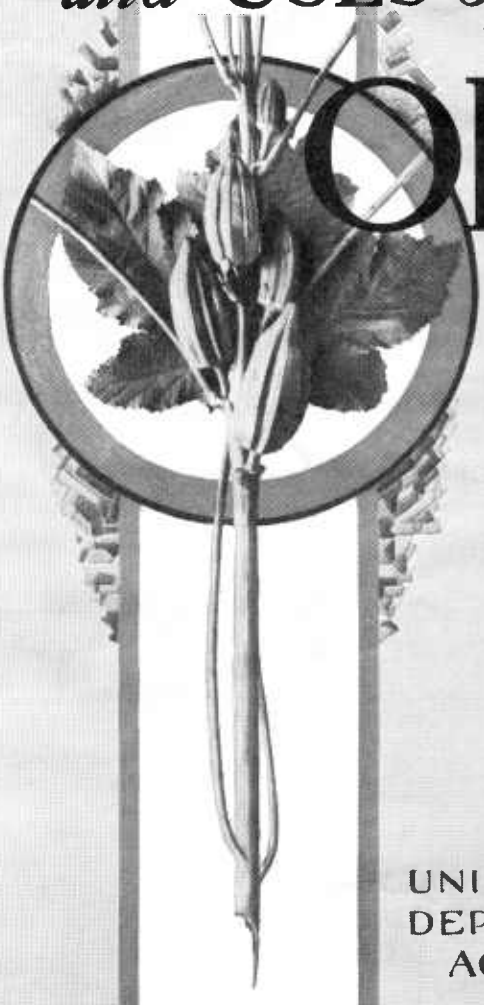
CULTURE *and* USES *of* OKRA



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UNITED STATES DEPARTMENT *of* AGRICULTURE

OKRA, OR GUMBO, is a desirable addition to the vegetables grown in the home garden. It has been grown and used for years in the South, where it is found in almost every garden, and it is increasing in popularity in the North.

In regions where the growing seasons are very short, okra plants may be started in a hotbed or a greenhouse and transplanted to the open ground.

Okra is easily grown on any good soil, and a few plants will be sufficient for the average family.

The edible portion consists of the pods, which must be gathered and used while young and tender.

Okra is used mainly in soups, but it may be served as a vegetable, boiled or baked, or as a salad. It may be kept for winter use by canning or drying.

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CULTURE AND USES OF OKRA

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Contents

OKRA AS A GARDEN PLANT

OKRA, or gumbo, is a tropical annual. For many years it has held an important place among the garden vegetables of the Southern States, where it is used mainly in soups and in preparations of which meat forms an integral part. The young and tender seed pods are used and give a pleasant flavor to soups and stews.

The okra plant somewhat resembles that of cotton, though having much larger and rougher leaves and a thicker stem. Its flowers, which are similar to those of cotton in size, shape, and color, are always single, and there is very little variation among those of different varieties.

Some persons may not enjoy the flavor of okra at first, but after eating a few times of dishes containing it a taste is acquired.

Okra may be grown throughout the greater portion of the United States, except the extreme northern part, but only one crop can be produced during a season in the northern part of the country. In the district around New Orleans successive plantings are made and a constant supply is maintained. The plant will not endure frost, but the production of pods begins very soon after the plants start into rapid growth and continues for several weeks, especially if all pods are removed every day and no seeds are allowed to ripen upon the plants.

THE SOIL AND ITS PREPARATION

Okra can be grown most successfully on a rich mellow loam, plowed rather deeply and well worked over with pulverizing tools. After the seedlings become established and the roots get a firm hold in the soil, growth is very rapid and a large amount of available plant food, especially of a nitrogenous nature, is required. Quick-acting commercial fertilizers may be applied in moderate quantities, but these should be well mixed with the soil. The same conditions that produce good cotton or corn are suitable for okra.

PLANTING THE SEED

In the Southern States, where a continuous supply is desired, successive seedings should be made 4 or 5 weeks apart. In the Northern States planting should be done as early as possible in the spring, or as soon as the soil is warm enough for the planting of beans and corn.

Plant in rows 3½ feet apart for the dwarf types and 4½ feet for the larger-growing varieties. Scatter the seeds in drills or plant loosely in hills and cover to a depth of 1 or 2 inches, according to the compactness and moisture content of the soil. The seeds may be planted with any good seed drill, but when placed in hills they should be separated 3 or 4 inches to allow space for the development of the stems. If the soil is reasonably warm, germination will take place within a few days; but should there be a heavy rainfall meantime, the soil should be lightly cultivated between the rows and the crust broken over the seed by means of a garden rake.

CULTIVATION

As soon as the plants are well established they may be thinned to two or three in a hill, or, if grown in drills, to 15 or 16 inches for the dwarf and 18 to 24 inches for the larger-growing varieties. Places vacant from failure in germination may be filled in by transplanting. Cultivate like corn or cotton, keeping the ground well stirred and the surface soil loose, especially while the plants are small. After the leaves begin to shade the ground very little cultivation is necessary except to keep the land free from weeds. A poor soil and insufficient moisture will yield pods of inferior size and quality, and irrigation may often be desirable in order to produce a marketable crop. The okra plants will usually continue to grow until late in the season, but after a time the pods are not so large or so tender as those produced earlier. As the pod is the only part of the plant ordinarily used for food, it is desirable to obtain a rapid and continuous growth in order to produce the greatest quantity of marketable pods.

GATHERING AND MARKETING

As soon as the plants begin to set fruit the pods should be gathered each day, preferably in the evening. The flower opens during the night or early morning and fades after a few hours, and the pods will usually be ready for gathering during the latter part of the following day, although the time required to produce a marketable pod varies according to the age of the plant and the conditions under which it is grown. The pods should always be gathered, irrespective of size, while they are still soft and before the seeds are half-grown. Figure 1 shows a flower, together with the pods formed the two previous mornings, the middle one of which is in the proper condition for gathering. The full-grown pods shown to the right and left of the flower were from those allowed to mature for seed.

The pods, after being gathered in large baskets, are sorted and placed upon the market in quart and half-peck berry boxes and also in hampers. To be in first-class condition the pods should reach the consumer within 36 hours after having been gathered, but they may be kept for several days in cold storage or by moistening and spreading them

thinly upon wooden trays in a cool cellar. The pods should never be shipped in tightly closed crates or in great bulk, as they have a tendency to become heated.

CULTIVATION FOR SEED

If okra is to be grown for seed alone, only one variety should be planted, or, if more than one variety is grown, each should be separated from the other by at least one-fourth mile, to prevent mixing. When several varieties of okra are grown near one another, no seed should be saved except that produced by the method of bagging and

FIGURE 1.—Flower and pods of okra. The pod in the center is in prime condition for gathering; the larger pods have been allowed to mature for seed.

hand-pollination. To obtain seed in this way is a rather simple matter when only a small quantity is required, as the pods formed on a single day when the plants are at their best will produce enough seed. The bags should be tied over the flower buds in the evening and the pollen transferred early the following day. Replace the bags immediately, as an insect or the wind may at any moment bring to the flower the pollen of another variety. After going over all the flowers of a variety it is well to return to the first three or four and repollinate them in order that they may receive pollen from different individual flowers of the same variety and to insure perfect fertilization. Before beginning upon another variety the brush used for transferring the pollen should be thoroughly cleaned. If a brush is not available, use a portion of a young leaf, folded together between

the thumb and finger, to convey the pollen. This improvised brush should be discarded and a new one adopted for each variety. The bags need remain only during the day on which the pollen is transferred and may be replaced by a tag to mark the pod. The seed should remain on the plant until fully ripe.

INJURIOUS INSECTS AND THEIR CONTROL[1]

In general the okra plant does not suffer serious injury from insect attack. Its most important insect pest is the cotton bollworm, which bores into the pods and thus injures them for food. The pods are also attacked by the southern green stinkbug and by several other species of plant bugs which pierce the pods and extract the plant juices. Since this damage occurs late in the season, the resulting loss is usually negligible. Blister beetles and leaf beetles, including several species of cucumber beetles and flea beetles, often feed on the foliage of okra, but ordinarily this damage appears to exert but little influence on the production of pods. In general, with the exception of blister beetles, these insects can be controlled by the application of a derris-dust mixture containing from 0.5 to 1.0 percent of rotenone, or by a derris-root powder spray containing approximately 0.025 percent of rotenone. The insecticide should be applied to the plants as soon as the presence of the insects is detected, and the treatment should be repeated as often as necessary to obtain control.[2]

Among other insect enemies of okra is the melon aphid. The best remedy for this pest is a spray of nicotine sulfate consisting of three-eighths of a pint (or 6 fluid ounces) of a 40-percent solution and 4 pounds of whale-oil or fish-oil soap or of white laundry soap per 50 gallons of water. For small gardens this solution may be mixed at the rate of 1 teaspoonful of nicotine sulfate and a 1-inch cube of soap to each gallon of water. In order to kill the insects this spray must be applied in such a manner as to make contact with their bodies. The application of a dust containing 2 percent of nicotine is also effective.

FOOD VALUE AND USES

The principal use of okra is in soups and various culinary dishes in which meats form an important part, as in the so-called gumbo soups, to which the young pods impart an excellent flavor.

In countries where large quantities of the pods are consumed they are dried and preserved, to be used during the part of the year when a fresh supply cannot be obtained. There are several methods of drying the pods. By one of these the pods are cut into slices crosswise and about one-half inch thick; the slices are then spread upon muslin-covered frames and dried, after which the okra is stored in thin bags until required for use. By another and more common method the very young pods are strung upon coarse threads and hung up to dry (fig. 2). In Turkey alone tons of the pods are preserved in this manner each year. A variety much used for drying is that known as petite

[1] Prepared in the Division of Truck Crop and Garden Insect Investigations, Bureau of Entomology and Plant Quarantine.

[2] For additional information in regard to insects attacking okra and methods of controlling them, apply direct to the Bureau of Entomology and Plant Quarantine, U. S. Department of Agriculture, or to your State agricultural experiment station or State department of agriculture. When in doubt concerning the identity of the insect causing the damage, send specimens. They should be placed in a preservative such as formalin and carefully packed and addressed to avoid breakage or loss in transit.

gumbo, or small okra. The pods of this variety are selected when only about one-half inch in length and of uniform size. These are strung on a cord of coarse fiber and hung up to dry (fig. 3).

Okra, like many other green vegetables, is valued in the diet chiefly because of the nutritionally important minerals it contains.[3] It is a good source of calcium and phosphorus and a fair source of iron. Fresh green okra is also a good source of vitamin A; drying okra reduces the vitamin A content by about half. Another value of okra in the diet is due to its indigestible residue, some of which is considered desirable to provide bulk in the digestive tract of persons in normal health. The

FIGURE 2.—Large pods of okra dried for winter use.

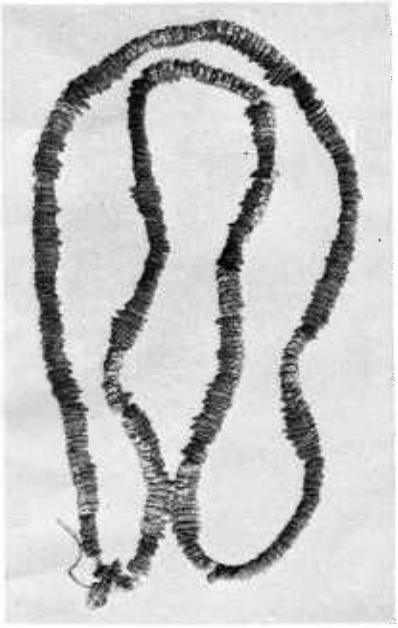

FIGURE 3.—Small pods of okra dried for winter use.

characteristic and delicate flavor of green okra makes it a great favorite in many families.

Analyses of okra show that it contains about 90 percent of water and only 10 percent of nutrient substance, which is made up of approximately 2 percent of protein, 7 percent of carbohydrate, and 1 percent of mineral matter. These figures indicate that okra would be useful in a low-caloric diet or in a diet that must be kept low in carbohydrate.

Okra when cooked in water or in a mixture with liquid may develop a mucilaginous consistency, which many persons especially like in this vegetable. This quality will not develop if the pods are not broken open by cutting or by long cooking. It is also lessened by cooking with acid foods such as tomatoes. The whole pods may be steamed or cooked in very little water, or the cut pieces either fried or cooked only a short time with a little fat, as in a greased casserole. Short lengths of okra may also be cooked quickly in stewed tomatoes.

[3] Information on food value and methods of preparing okra supplied by the Bureau of Home Economics.

METHODS OF PREPARATION

The tender green okra pods lend themselves to a number of ways of preparation, either alone or in combination with other vegetables, or in soups and stews. Dried okra is especially good in soups, though it can be used in any recipe calling for fresh okra if it is first freshened in water and then drained and wiped dry.

Okra should be cooked in agate, porcelain, aluminum, or earthenware utensils. Copper, brass, or iron cooking utensils should not be used in preparing okra, as the pods become discolored.

CHICKEN GUMBO

1 quart young okra.
1 chicken, 3 to 4 pounds.
1 slice ham, about 1 pound.
4 tablespoons butter or other fat.
1 quart fresh skinned chopped tomatoes or cooked tomatoes.
1 large onion, chopped.
1 sprig parsley.
3 quarts boiling water.
Salt.
A little cayenne.

Wash and stem the okra and cut in ½-inch slices. Dress and cut up the chicken. Fry the okra in 2 tablespoons of the fat in a large kettle until lightly browned. Remove from the kettle. Melt the remaining fat in the kettle, add the chicken and ham, cover closely, and cook for about 10 minutes, turning when necessary. Add the tomatoes, onion, parsley, water, and browned okra. Simmer for an hour or two, or until the chicken and ham are tender. Add salt to taste and a little cayenne. Serve with flaky cooked rice.

OKRA AND BEEF STEW

1 pint okra.
2 pounds lean beef.
Salt.
Pepper.
¼ pound fat.
1 large onion, chopped.
2 quarts cold water.

Wash the okra thoroughly, discard the stems, and chop the okra very fine. Cut the beef into small pieces; season with salt and pepper. Melt the fat in a large kettle, add the meat and onion, and stir until lightly browned. Add the cold water and simmer until the meat is tender, then add the okra and continue to simmer until the okra is tender. Add more seasoning if necessary. A No. 2 can of okra can be used to replace the fresh okra and a No. 3 can of tomatoes to replace 1 quart of the water.

BOILED OKRA

1 quart young okra.
1 pint water.
¾ teaspoon salt.
Pepper.
1 tablespoon butter.
1 tablespoon tarragon vinegar.

Wash the okra and cut off the stem ends. Cook in boiling salted water until tender, or about 10 minutes. Drain and add the seasoning. Serve hot or cold.

OKRA SALAD

Young okra pods, boiled whole and chilled, may be served on lettuce with French dressing. They may also be used in a combination salad with sliced tomato or grated carrot and cut celery, cooked string beans and onion, or crisped chopped bacon. This salad may be served on lettuce or other salad greens.

BAKED OKRA

Select young okra, wash thoroughly, remove the stems, and wipe the okra dry. Fill a greased baking dish with the okra, sprinkle with salt, and dot with butter or other fat. Cover and bake in a moderate oven (350° F.) until the okra is tender. Serve in the baking dish.

FRIED OKRA

2 quarts young okra.
4 tablespoons fat.
Salt to taste.

Wash the okra, dry thoroughly, and cut crosswise in pieces about one-half inch thick. Heat the fat in a frying pan, add the okra, cover, and cook 10 minutes. Stir frequently to prevent scorching. Remove the cover, continue to cook until the okra is tender, and brown lightly. Serve at once.

If preferred, the okra may be rolled in seasoned corn meal before being fried. Also the whole pods may be parboiled and drained, then dipped in corn meal, and fried.

OKRA FRITTERS

1 pint young okra.
1 tablespoon butter or other fat.
1 egg.
½ cup milk.
1 cup sifted flour.
½ teaspoon salt.
2 teaspoons baking powder.
Fat for frying.

Wash and stem the okra, dry thoroughly, and cut crosswise into thin slices. Melt the fat in a frying pan and brown the okra slightly, stirring frequently. Combine the beaten egg and milk. Add gradually to the sifted dry ingredients, stirring only until the batter is smooth; then stir in the okra.

Drop the batter by spoonfuls into deep fat heated to 365° to 370° F. Remove when light brown on both sides and drain on absorbent paper. Or, the fritters may be fried in shallow fat.

SCALLOPED OKRA AND TOMATOES

1 quart young okra.
4 tablespoons butter or other fat.
1 small onion, chopped.
1 quart fresh skinned chopped tomatoes or cooked tomatoes.
2 teaspoons salt.
Pepper.
1 cup fine, dry bread crumbs.

Select young okra, wash thoroughly, remove the stems, dry the okra, and cut in ½-inch slices. Melt 2 tablespoons of the fat in a frying pan, add the onion and okra, and cook until both are slightly browned, stirring frequently. Add the tomatoes, salt, and pepper, and simmer for about 10 minutes. Pour the mixture into a shallow greased baking dish and cover with the bread crumbs mixed with the remaining melted fat. Bake in a moderate oven (350° F.) for 15 minutes, or until the okra is tender and the crumbs are browned.

BAKED OKRA, RICE, AND TOMATOES

1 quart young okra.
¼ cup rice, washed.
1 quart cooked tomatoes.
1½ teaspoons salt.
Pepper.
Curry (if desired).
Butter.

Wash the okra thoroughly, remove the stem ends, and cut into thin slices. Sprinkle about 1 tablespoon of the rice in a greased baking dish, cover with a layer of the okra and then with a thin layer of the tomatoes, and repeat. Season each layer with salt and pepper and dot with butter. Cover and bake in a very moderate oven (325° F.) until the rice is tender. Remove the cover to allow slight browning.

SCALLOPED OKRA AND CORN

3 cups sliced okra.
4 tablespoons butter or other fat.
2 cups cooked corn.
1 teaspoon salt.
Pepper.
2 tablespoons flour.
1 cup milk.
¼ pound sharp cheese.
1 cup fine, dry bread crumbs.

Fry the okra in 2 tablespoons of the fat for about 10 minutes, stirring frequently to prevent scorching. Place the okra and corn in alternate layers in a greased baking dish. Sprinkle each layer with salt and pepper, reserving one-fourth teaspoon of salt for the sauce. Make a sauce of the 2 remaining tablespoons of fat, the 2 tablespoons of flour, and the milk. Add the cheese and salt, and stir until the cheese has melted. Pour over the okra and corn, and cover with the crumbs. Bake in a moderate oven (350° F.) until the mixture is hot through and the crumbs are brown.

CANNED OKRA AND TOMATOES

Use only young, tender okra and sound, ripe tomatoes. Wash the okra and slice crosswise. Wash the tomatoes, scald, remove the skins and cores, and cut into sections. Combine the okra and tomatoes, and heat to the boiling point. Pack while hot into containers and add 1 level teaspoon of salt to each quart. Partially seal glass jars and process pint jars 25 minutes at 240° F. or 10 pounds pressure, and quart jars 35 minutes at the same temperature. Complete the seal immediately after removing the jars from the boiling water. Plain tin cans are used for this product. Seal immediately after filling, and process the No. 2 cans 25 minutes at 240° F. or 10 pounds pressure, and No. 3 cans 30 minutes at the same temperature.

TYPES AND VARIETIES

There are three general types of okra, viz, tall green, dwarf green, and ladyfinger. Each of these is again divided according to the length and color of the pods, making in all six types, as follows: Tall green, long pod; tall green, short pod; dwarf green, long pod; dwarf green, short pod; ladyfinger, white pod; and ladyfinger, green pod. All variations from these are merely the results of mixtures, no true crosses or hybrids being formed. These mixtures are easily separated and referred to the parent type, and a little attention to roguing and selection is necessary in order to keep the varieties pure. It is essential that the varietal strain should be pure, in order that a uniform and marketable lot of pods may be produced.

The types listed above may be described as follows:

TALL GREEN.—Height of plant, 4 to 8 feet; habit of growth, upright, not spreading, sometimes branching near the ground, but all stems erect; leaves large, borne on long petioles; pods in axils of leaves, on short stem; color of pods, green.

Tall green, long pod.—Pods long, 3 to 5 inches when ready for marketing, 7 to 11 inches when mature; five-eighths to 1¼ inches in diameter; 5- to 8-sided (fig. 4).

FIGURE 4.—Tall green long-pod type.

Tall green, short pod.—Pods short, 1½ to 2 inches when ready for marketing, 3 to 5 inches when mature; 1 to 2 inches in diameter; 7- to 11-sided (fig. 5).

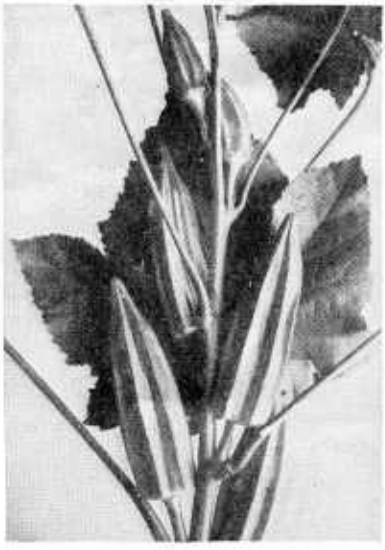

FIGURE 5.—Tall green, short-pod type.

DWARF GREEN.—Height of plant, 20 inches to 3½ feet; habit of growth, bushy, spreading from near the ground; leaves rather small, on slender petioles; pods green.

Dwarf green, long pod.—Pods long, 2 to 4 inches when ready for marketing, 6 to 10 inches when mature; five-eighths to 1¼ inches in diameter; 5- to 8-sided, tapering to a point at the blossom end, point usually curved inward toward the stem of the plant; leaves deeply cleft or divided (fig. 6).

FIGURE 6.—Dwarf green, long-pod type.

Dwarf green, short pod.—Pods short, 1½ to 3 inches when ready for marketing, 3 to 6 inches when mature; 1½ to 2½ inches in diameter when fully grown; 7- to 12-sided; leaves large, almost entire (fig. 7).

FIGURE 7.—Dwarf green, short-pod type.

LADYFINGER.—Height of plant, about 3 feet, very much branched and of bushy habit; leaves large, borne on long petioles, the lower ones sometimes more than 2 feet in length. The entire plant is of a lighter color than either of the other types. The only distinction between the varieties of this type is found in the color of the pods. Pods 4 to 5 inches long when ready for gathering, 6 to 10 inches when mature; ¾ to 1¼ inches in diameter when mature; slightly 7- to 8-angled; and covered with numerous soft hairs (fig. 8).

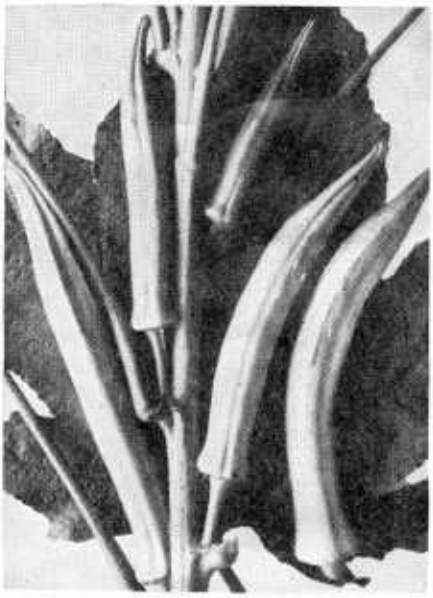

FIGURE 8.—Ladyfinger type.

Ladyfinger, white pod.—Pods greenish white or nearly white.
Ladyfinger, green pod.—Pods pale green, in some cases nearly pure green.

The varieties known to the seed trade as Perkins Mammoth, Long Green, Dwarf Green, and White Velvet are in most common use. White Velvet is one of the best varieties. There is but slight difference between varieties as regards earliness.

Clemson Spineless was developed from a single stalk found by Thomas Davis, of Lancaster, S. C., in his garden prior to 1880. When progeny of this selection was grown in the experimental garden of the South Carolina Agricultural Experiment Station it proved to be a dwarf white-podded okra with some mixture of other types; however, the pods were largely spineless. Seed was saved and a planting made the following year, from which a number of strains were selected. These and other selections were grown for several years, and one of them was introduced as Clemson Spineless. This variety grows about 3½ to 4½ feet tall on soil of medium fertility and produces dark-green pods. It resembles Perkins Mammoth in its habit of growth. Its spineless pods and somewhat sparse foliage make it less troublesome to harvest than other varieties. Clemson Spineless was awarded a silver medal in the 1938 All-American Selections.

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