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Different types of fish drying methods in Gujarat

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Abstract
Gujarat contribute major role in dried fish products export from India. In this study, collected information about different raw material of 33 fish species for dried fish product and different methods for drying of fishes. Various fish drying methods used for dried fish from traditional to modified techniques with sun light. Improvement required in fish drying method for preparation of hygienic dried fish products.

Keywords: Drying, dried fishes, different drying methods, Gujarat

Introduction
Fresh fish is highly perishable and various preservation techniques such as chilling, freezing, drying, salting and smoking are commonly used to extend its shelf life. Drying is the most affordable traditional fish preservation methods that are commonly used in many developing countries. The preservative effect of salting and drying is mainly due to the decrease in water activity, which turn prevents the growth of many spoilage organisms is prevented.
Dry fish processing is a common practice of Gujarat coastal region and about 20% of the catch is being processed regularly for domestic and overseas consumption. Totally, 11 export units and 350 domestic dry fish units are involved in processing of dry fish in Gujarat state. About 5000 MT of dry fish per season is regularly exported from India, which accounts for about 80% of total exports from Gujarat. In Gujarat, Veraval, Okha, Jafrabad, Navabandar and Porbandar are big fish landing centers for dried fishes. Great demand of hygienic dried fish and other byproducts from fishes. Global demand for sharks and rays derived products [1].
Sun drying of fishes is also a simple and the oldest known method of fish preservation. It is considered as the least expensive method of fish preservation [2]. This traditional method is followed for the preservation of fish especially in rural areas [3]. Sun drying is the most convenient and the cheapest processing technique to preserve fish and fish products [4, 5], particularly in tropical and subtropical countries, where solar radiation is abundant, inexhaustible and environmental friendly [6]. The drying process deeply impacted the final characteristics of the products, mainly in terms of protein denaturation [7].

Results and Discussion
Gujarat contributes major roles in fish landing (marine catches), large amount of raw material available for preparation of dried fishes. Different types of fishes as a raw material show in Table 1.

Different types of fish drying methods
In Gujarat, different types of fish drying available with used of sun light likes drying on sand, drying on mate, drying on rack, drying on bamboo pole, drying with rope, drying with green house type drier etc. Mostly, fishermen used sunlight drying in open condition. Some hanging (drying with rope) gave fast drying as compare to other technique. Modern technique - drying with green house type drier is closed system to provided good hygienic dried fish products. Microorganisms play an important role in the spoilage of fish [8].
Small fishes are usually dried whole, whereas the large fishes are split open and spread in the sun in tropical countries, allowing moisture to evaporate from the flesh surface. Natural drying by exposure to sun and wind is wide spread and is still applied to a large extent to preserve fish [9]. Dried fish meat has a heterogeneous structure. That is, the surface became harder than its inside as the moisture evaporation proceeded [10]. However, the quality of the dried fish never received much attention at any stage of processing, storage and marketing [11].

Table 1: Fishes for drying purpose

Sr. No.	Scientific name	Common name	Local name
1	*Harpodon nehereus*	Bombay duck	Dataniya bumbla
	Lepturacanthus savala	Ribbon fish	Baaga
2	*Coilia dussumieri*	Gold spotted Anchovy	Mendali
3	*Megalaspis cordyla*	Horse mackerel	Bangada
4	*Rastrelliger kanagurta*	Indian Mackerel	Malbari
5	*Chirocentrus dorab*	Silver bar	Dai
6	*Acetes indicus*	Jawla shrimp	Jawla
7	*Cynoglossus lingua*	Sole fish	Jeebh
8	*Scoliodon laticaudas*	Indian dog shark	Sandhi
9	*Scomberoides commersonianus*	Queen fish	Chhapri
10	*Otolithes cuvieri*	Croaker	Dhoma
11	*Sardinella longiceps*	Oil sardine	Add
12	*Solenocera crassicornis*	Mud shrimp	Jinga
13	*Terapon jarbua*	Jarbua terapon	Hajamro
14	*Saurida tumbil*	Greater lizard fish	Bhungar
15	*Saurida undosquami*	Brush tooth lizard fish	Bhungar
16	*Dasyatis zugei*	Pale-edged sting ray	Varala
17	*Arius thalassinus*	Giant catfish	Khagi
18	*Carax para*	Golden scad	Para
19	*Ilisha megaloptera*	Big eye ilisha	Dorari Kati
20	*Zebrias quagga*	Zebra Sole	Jibh
21	*Lactarius lactarius*	White fish	Khitali
22	*Mene maculate*	Moon fish	Chand Fish
23	*Scoliodon laticaudus*	Spadenose shark	Sandho

General information for fish drying

- Generally 3-4 days required for fish drying in sun light.
- Final dried fish products should have less than 10-15% moisture for long terms preservation.
- Green House type drier is better than traditional drying method.
- Drying on rack and bamboo poles is more efficient than drying on land.

Fishes for drying purpose

Sole fish

Bombay duck

Croacker

Ribbon fish

Cat fish

Gold spotted Anchovy


Drying on sand


Drying on Mate


Drying on Rack


Drying on Bamboo Pole


Drying with rope


Green House type drier

Conclusion

Fish drying using sunlight includes traditional method like Sand drying in ground & mate and modified technology – green house type drier available in Gujarat state. Modified drying technology of dried fish products is better than traditional method in terms of quality due to maintain quality of dried fish products.

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