

Pu-erh Tea

College of Pu-erh Tea

Yunnan Agricultural University



WAN-FANG SHAO

2009-12



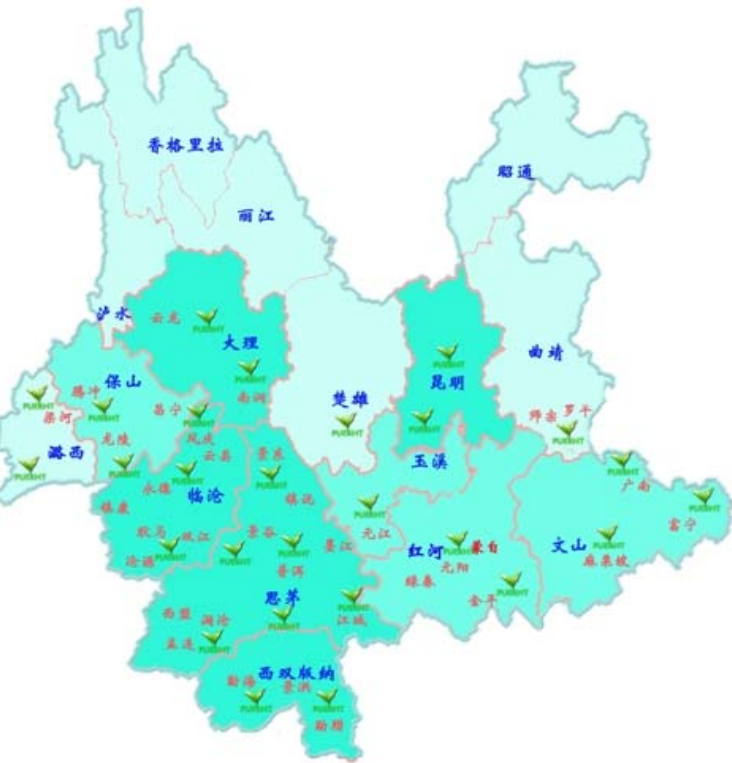


Outline

- I .Pu-erh Tea's long history
- II .Pu-erh Tea's unique origin
- III. Pu-erh Tea's unique raw material
- IV. Pu-erh Tea's unique processing
- V . Pu-erh Tea's unique quality
- VI. Pu-erh Tea's unique effects on human health

Tea in Yunnan

Very important



Chairman Hu in Yunnan Tea Garden

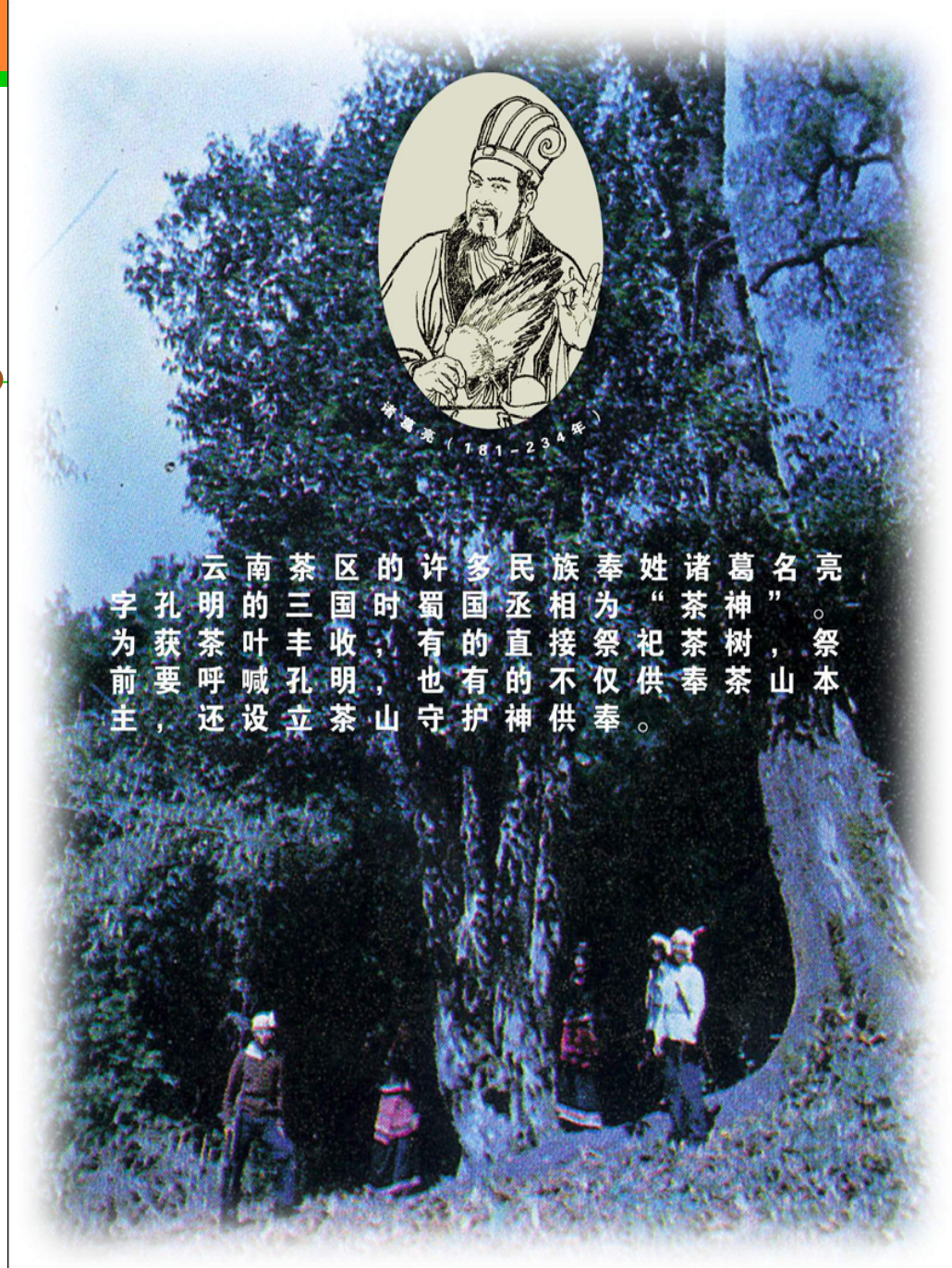


诸葛亮



诸葛亮 (181-234年)

诸葛亮，字孔明，号卧龙，琅琊阳都人。刘备在白帝城病危时，将幼子刘禅托付给他，他尽心辅佐，建立了蜀汉政权。他一生致力于兴复汉室，平定南方，北伐中原。他发明了木牛流马，创造了八阵图，是三国时期杰出的政治家、军事家、发明家、外交家。他去世后，被尊为“武侯”，其祠庙遍布各地。在云南，他被尊为茶神，人们会在茶山举行祭祀活动，祈求茶业丰收。



A Wild Old Tea Tree

More Than 2700 Years Old

- Tall: 25.6M
- Diameter: 1.2M



A Wild Old Tea Tree More Than 1700 Years Old

- Tall: 32.12M
- Diameter: 2.9M



Old Tea Tree (Fengqing)



Transition type

- Tall: 11.8M
- Diameter: 1.14M



滇1：云南邦崴大茶树

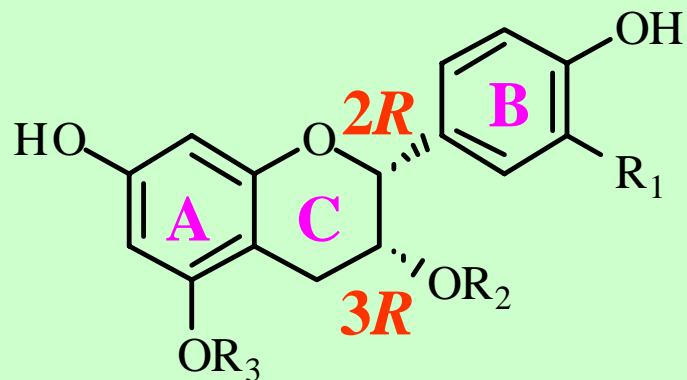
1,000 years old Jingmai Tea Plantation



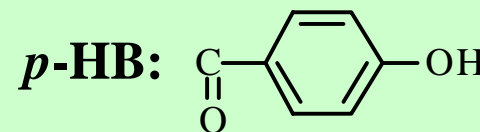
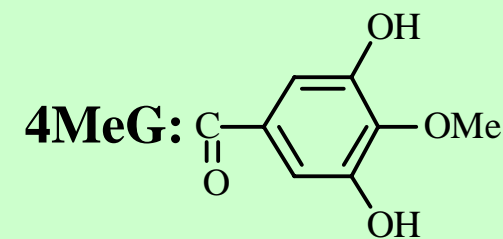
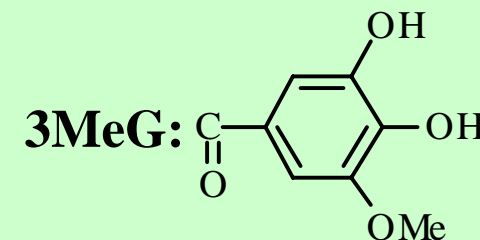
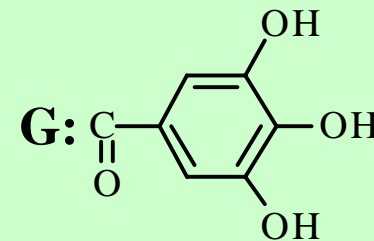


Flavan-3-ol

Catechol



(-)-epiafzelechin (EA)	H	H	H	-
3-O-gallate (EAG)	H	G	H	0.2
(-)-epicatechin (EC)	OH	H	H	4.1
3-O-gallate (ECG)	OH	G	H	11.1
3-O-(3'-O-methyl)-gallate	OH	3MeG	H	0.3
3-O-(4'-O-methyl)-gallate	OH	4MeG	H	0.02
3-O-p-hydroxybenzoate	OH	p-HB	H	0.01
3,5-di-O-gallate	OH	G	G	0.1

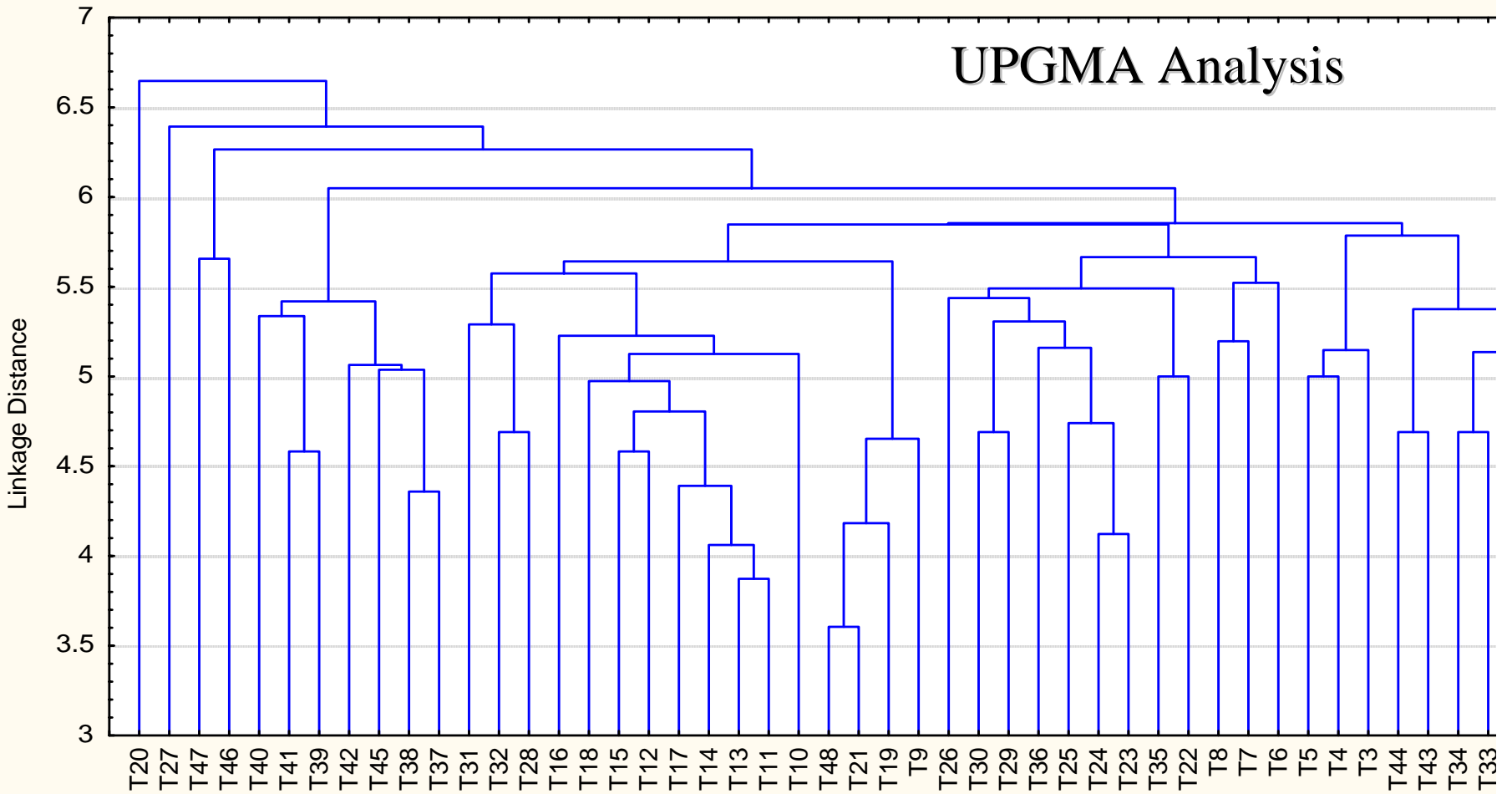




2002 11 19

Tree Diagram for 48 Variables
Unweighted pair-group average
Euclidean distances

UPGMA Analysis



- In most countries tea is plucked manually.
- Pick the top two leaves and bud from new shoots that sprout on the top of the bushes.





茶 白族姑娘采茶

|x



茶 景颇族姑娘采茶



Old Tea Trees



Pick Tea Bud in Yunnan

“勐库大叶种茶叶被誉为‘云南大叶茶正宗’、‘云南大叶茶的英豪’。勐库大叶种茶条索肥厚、芽峰显毫、滋味浓郁、回甘悠远、内含物质丰富、水浸出物高，是制作普洱茶、红茶的最佳原料。目前，双江全县有茶园面积9万多亩，其中百年以上的栽培型古茶园达2万多亩，年产茶叶5000多吨。优越的生态环境、独特的气候条件、优质的原料基地、天然的存储仓库，孕育了‘勐库普洱茶’和‘天下普洱第一仓’的知名品牌。”



Pu-erh Tea's characteristics

Unfermented Pu-erh tea

- Black-green tea leaves; long-lasting and pure aroma; mellow and after-sweet flavor; bright and yellowish-green liquor; the infused leaves are thick and yellowish-green



Unfermented Pu-erh tea



the tea liquor



the infused leaves



- **Factors affecting the production of Pu-erh tea**

- **High moisture in sun-dried tea**
- **Long time storage before trading**
- **Long, sultry valley**
- **Location and climate of Yunnan Province**

Piled-fermented Pu-erh Tea

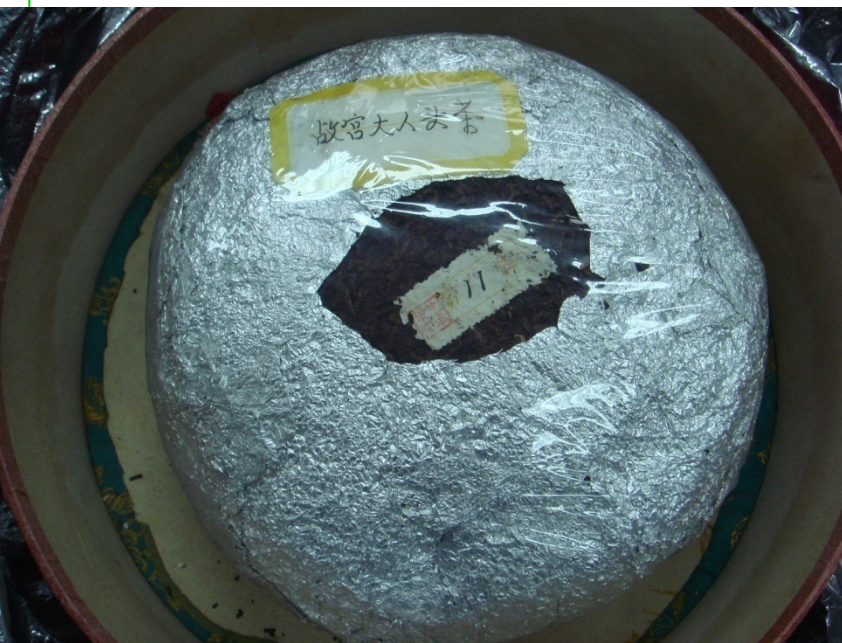
■ Reddish-auburn tea leaves; bright and red liquor; unique aging aroma; mellow and sweet after-taste; the infused leaves are reddish-auburn



The liquor

“The Head-shaped Tea” from the Qing Dynasty has been kept in the Palace Museum in Beijing. It remains unchanged.





The examiners holding the Golden Melon Royal Tea or Pumpkin Royal Tea, a tribute in ancient times.

weighing





金瓜贡茶

老普洱茶

千两茶

The uniqueness of Pu-erh Tea

- **Yunnan Pu'er compressed tea is a kind of post-fermented tea.**
 - **mellow and sweet after-taste**
 - **bright and brownish-red liquor**
 - **aging aroma**
 - **long-lasting storing**

Pu-erh Tea's uniqueness

■ 1. the unique origin or production location.

The original place of Pu-erh tea is located in Lancang River Valley, including the whole Xishuang Banna and Simao region nowadays. Hygrothermal climate and complicated surface feature are important to form the adapt circumstance.

Source area scene



Tea mountain scene



2. the unique raw material

- The ingredients in fresh tea leaves vary with the different varieties of tea plants. The raw material of Pu-erh Tea is from a morph (*Camellia assamica*), Yunnan large-leaved variety. It has much higher levels of tea polyphenol, catechin, theine, theanine and water extraction than small and medium-leaved varieties.



Camellia assamica





A photograph of a tea garden. In the foreground, a dirt path leads from the bottom left towards the center. To the right of the path, a large, dense tree with dark green leaves stands prominently. The background features a hillside covered in tea bushes, with several tall, thin trees scattered across the top. The sky is overcast with grey and white clouds. The overall scene is a rural landscape dedicated to tea cultivation.


Tea garden

3. the unique processing of Pu-erh Tea

- Actually, historical Pu-erh Tea is made of fresh large-leaves though deactivation of enzymes and rolling and drying. It is commonly called “Green primary tea”, which is rolled and fried by handwork.



■ The processing of Pu-erh Tea

- 
- The first operation work is piled-fermentation. The quality of Pu-erh tea is heavily dependent on this process.

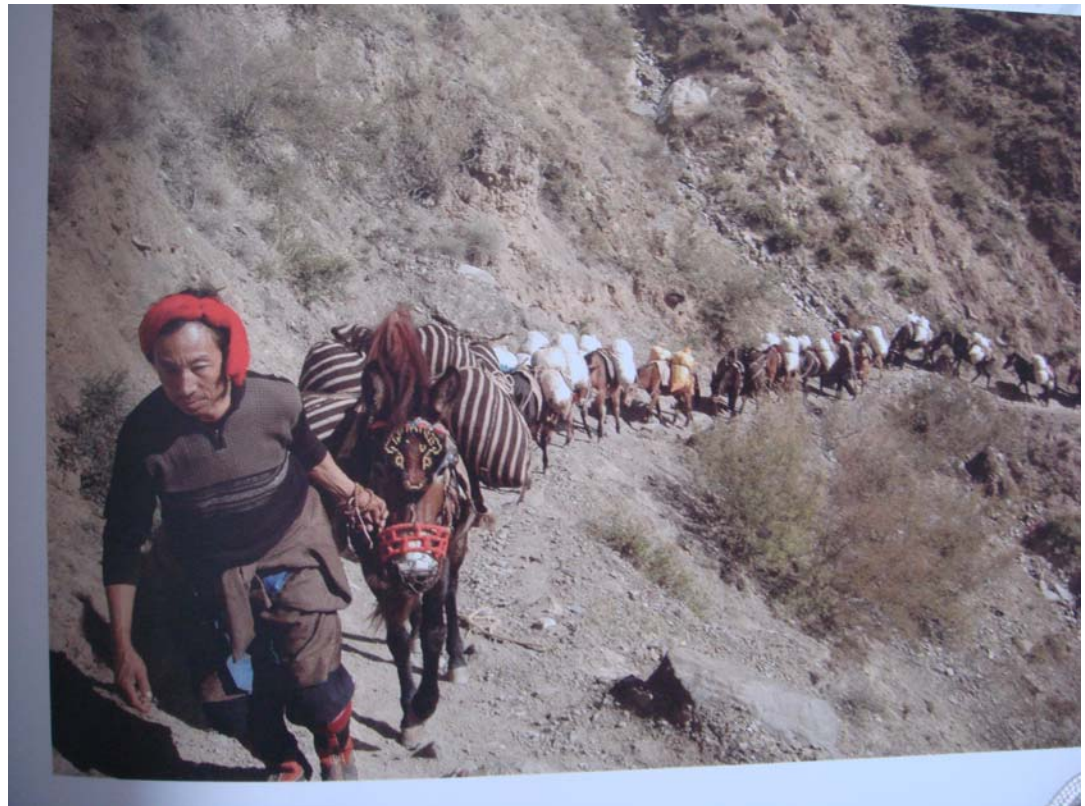


baking

烤房



■ Natural post-fermentation during long-term transportation of the tea



Investigate the health benefits of Pu-erh tea





Tested materials (L-R):
Fermented Pu-erh tea;
Unfermented Pu-erh tea;
Chinese herbal



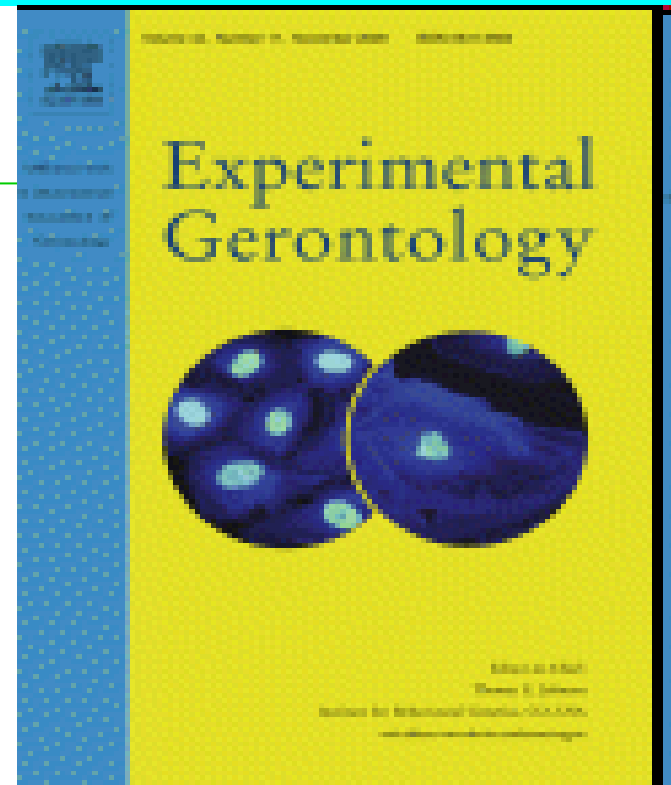
Pu-erh tea -- an easy way to deal with human diseases

- Lower atherosclerotic risk factors in rat hyperlipidemia model
- Anti-oxidative effects in aged mice model
- Anti-immunosenescence effects in aged mouse model

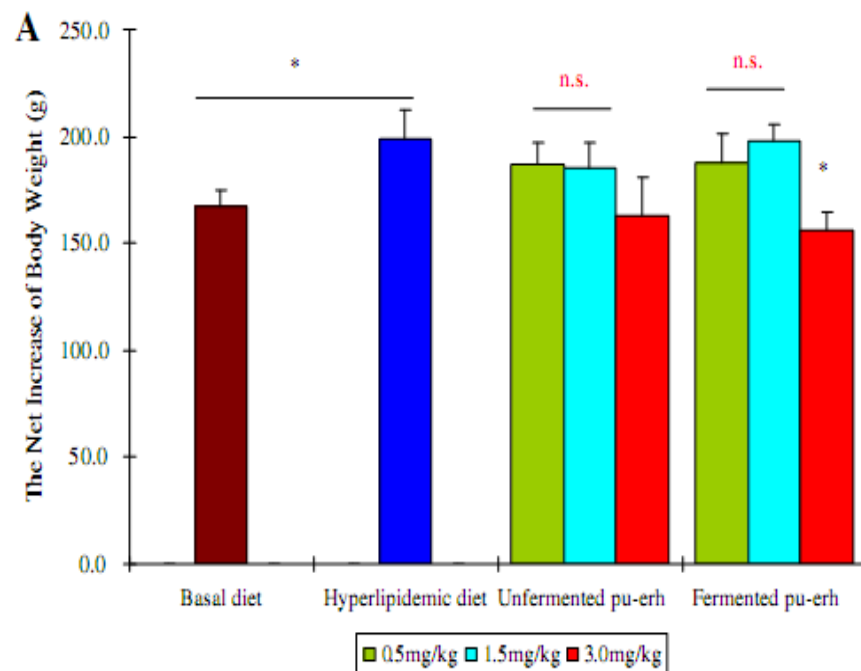
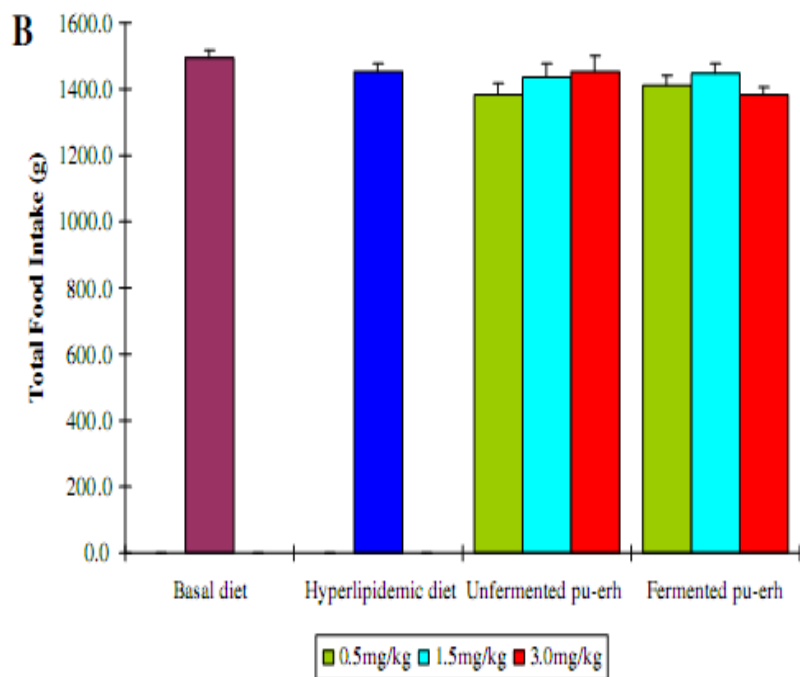
Project 1

Pu-erh tea aqueous extracts lower atherosclerotic risk factors in rat hyperlipidemia model

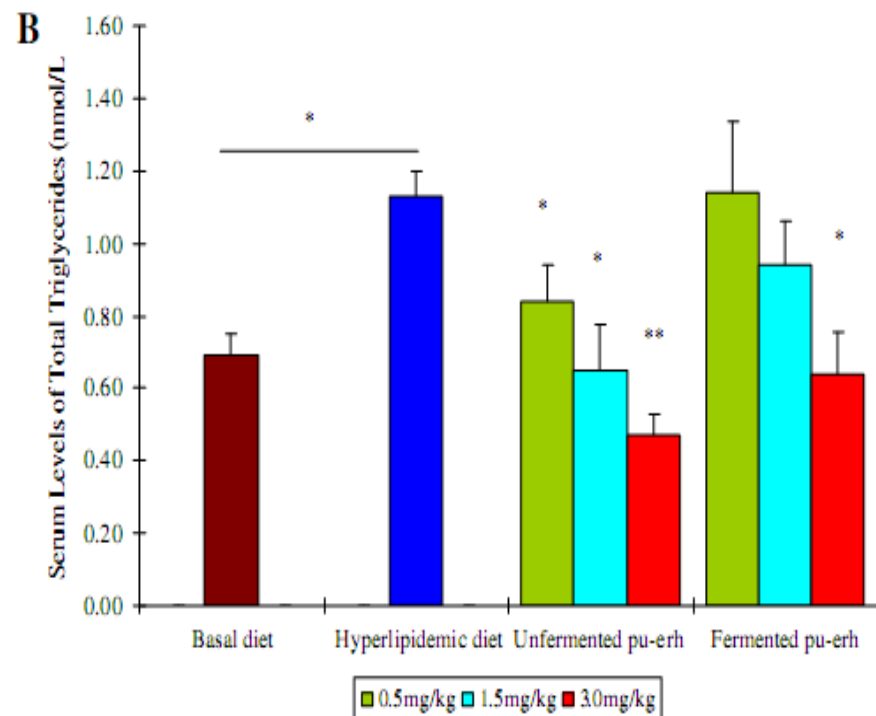
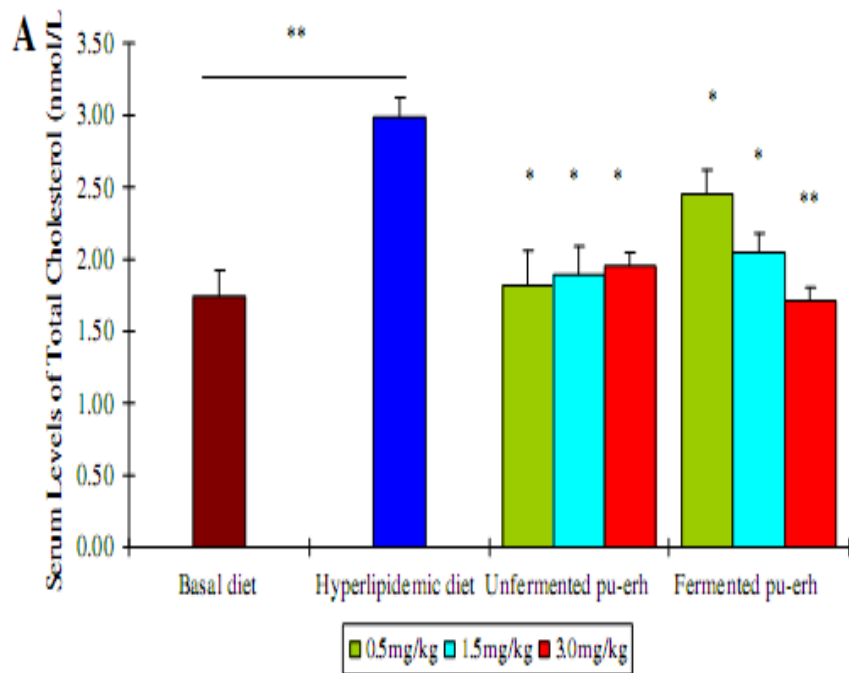
Experimental Gerontology, Volume 44, Issues 6-7, June-July 2009, Pages 434-439



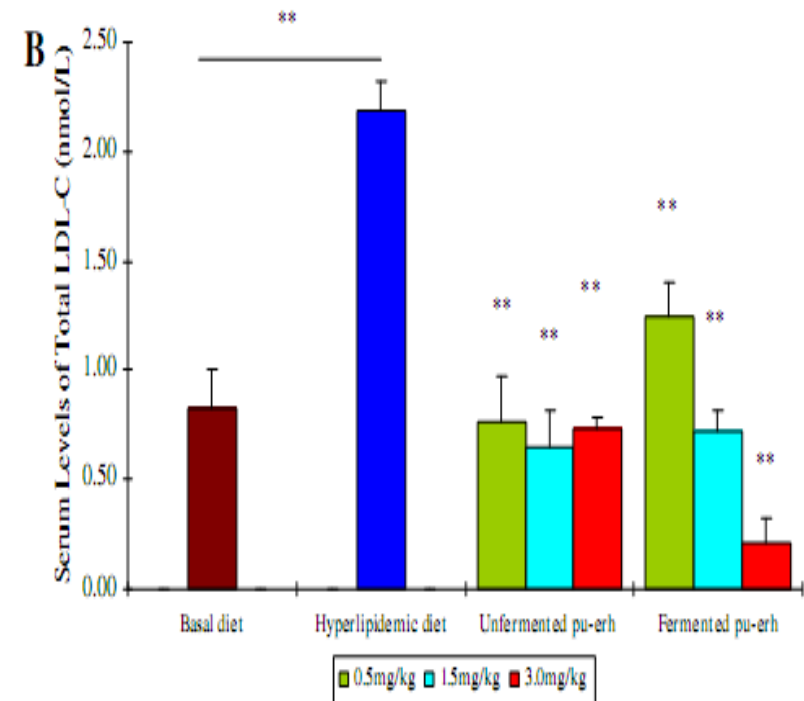
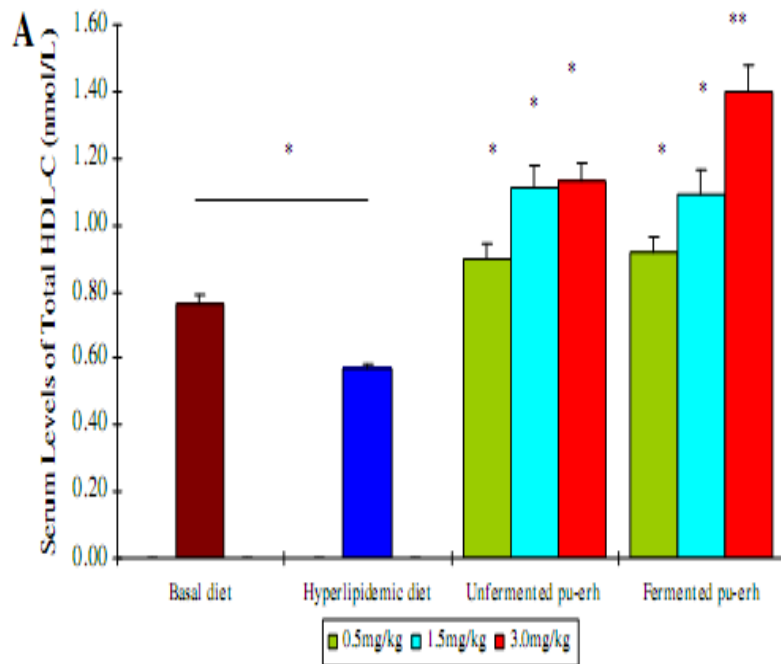
Body weight gain in the rats was reduced by highest dose of fermented tea extract without increasing in food intake, suggesting large consumption of tea inhibits over-eating induced obesity.



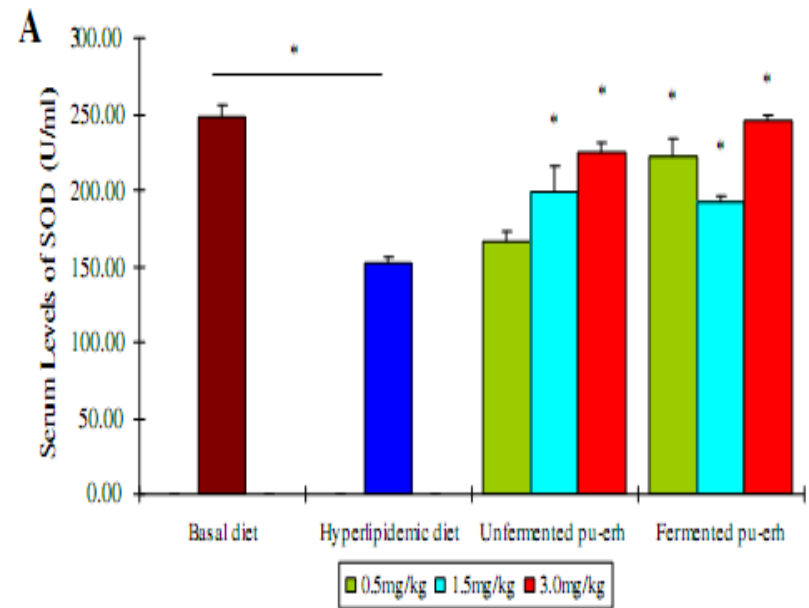
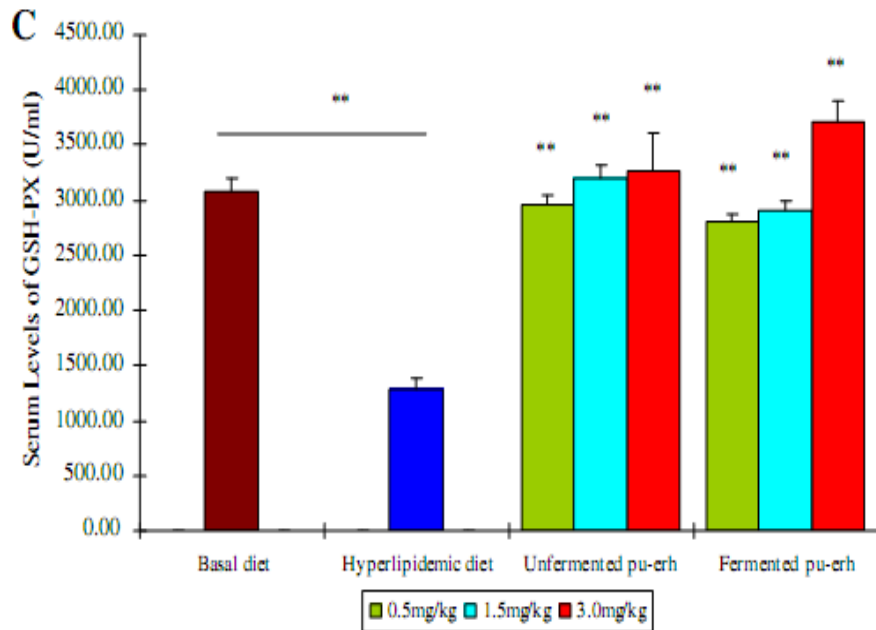
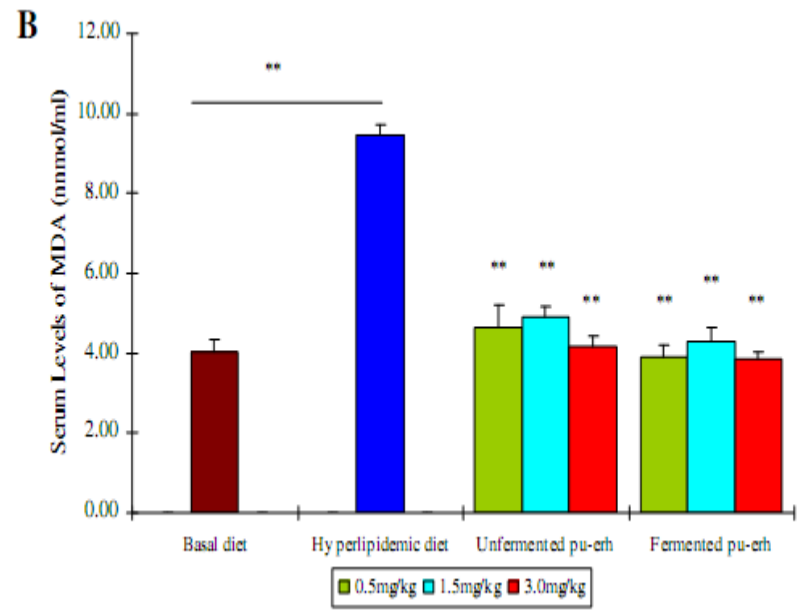
Pu-erh tea dose-dependently reduces serum levels of total cholesterol (TC) and triglycerides (TG) in rats fed hyperlipidemic diets.



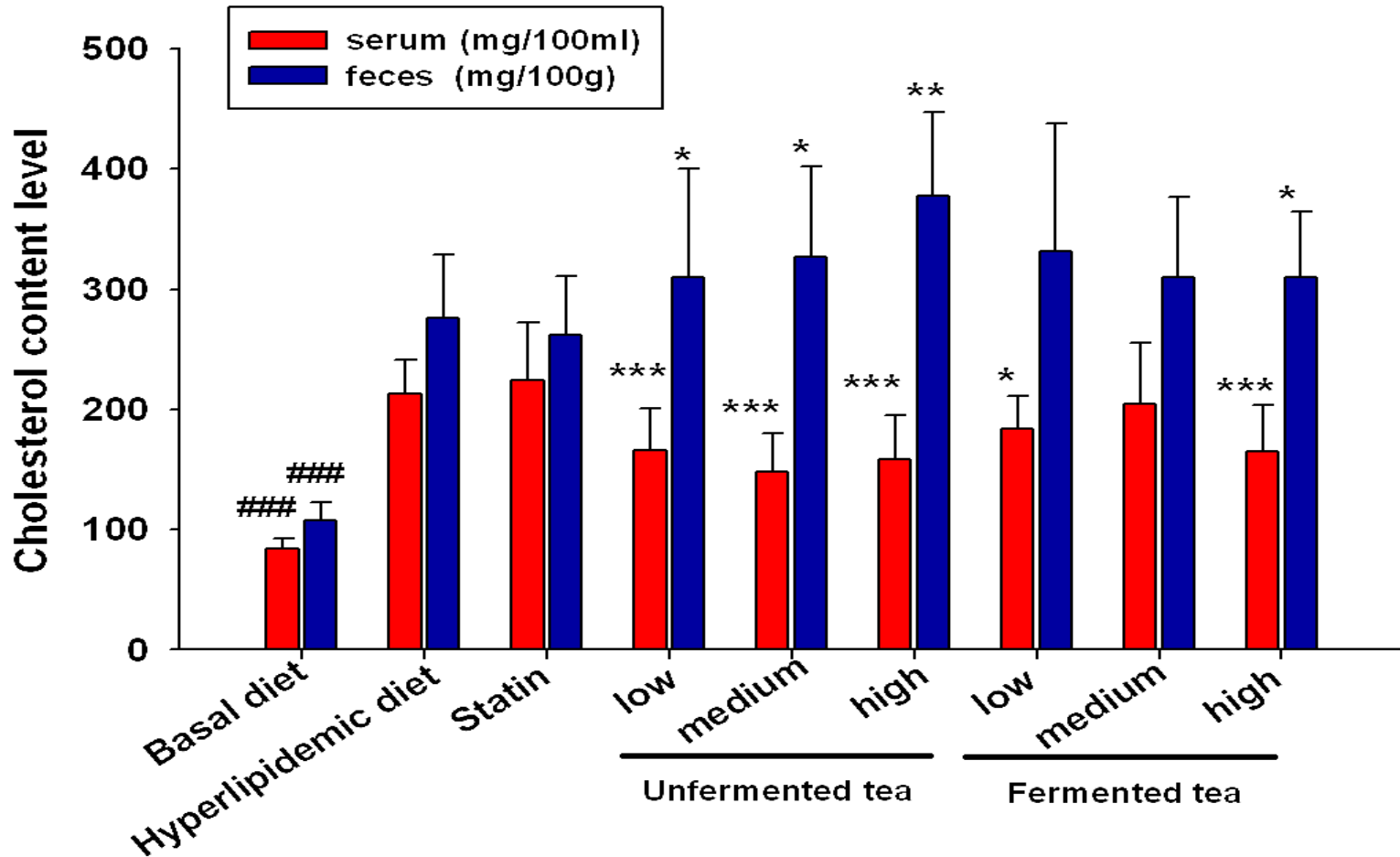
Pu-erh tea significantly increases serum levels of high density lipoprotein cholesterol (HDL-C) and reduces low density lipoprotein cholesterol (LDL-C) in hyperlipidemic rats.



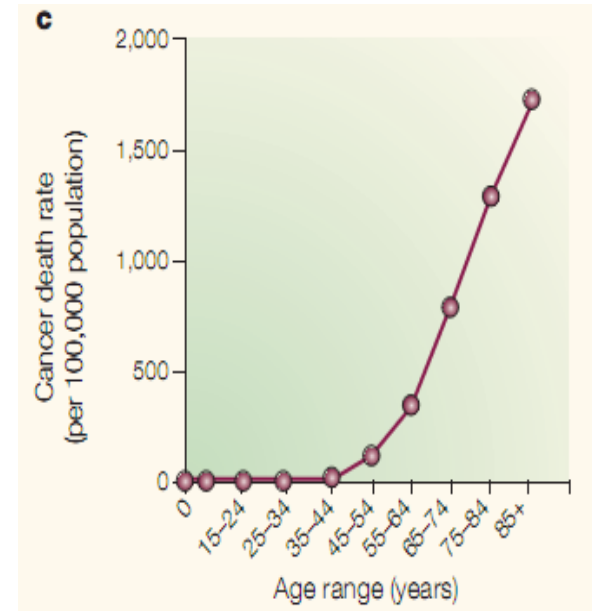
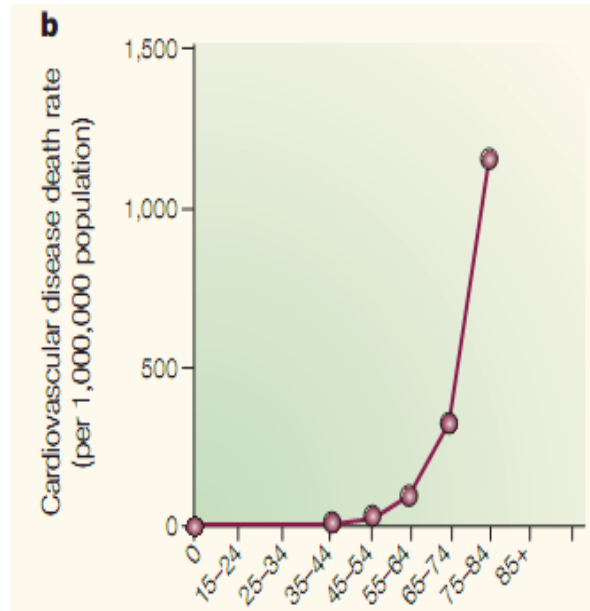
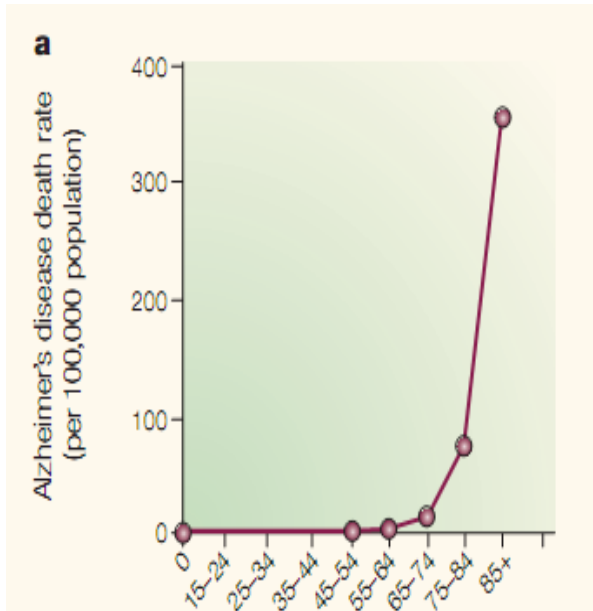
Pu-erh tea reduces serum levels of malondialdehyde (MDA) while increases superoxide dismutase (SOD) and glutathione peroxidase (GSH-Px).



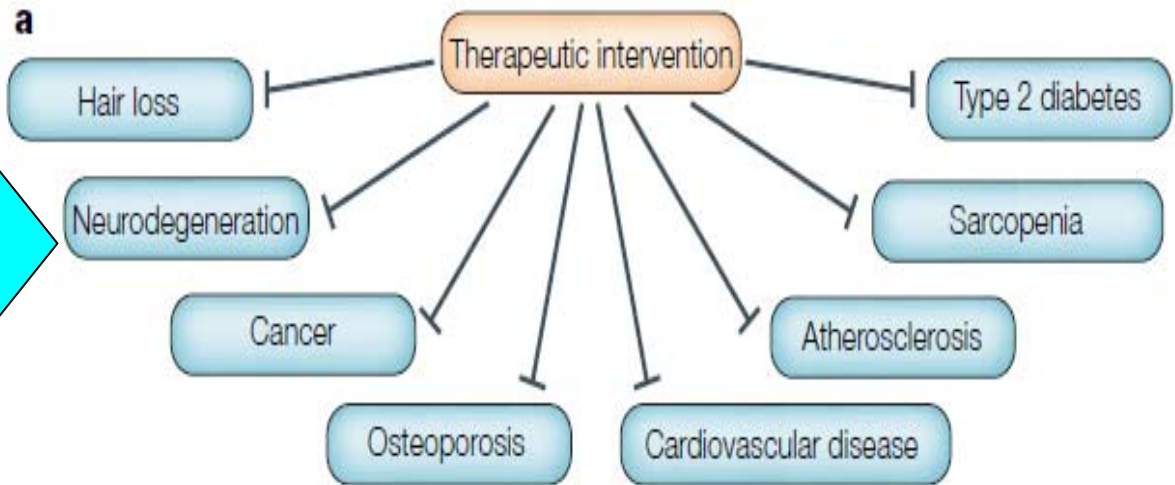
Pu-erh tea gavages: serum cholesterol decrease while fecal cholesterol increase



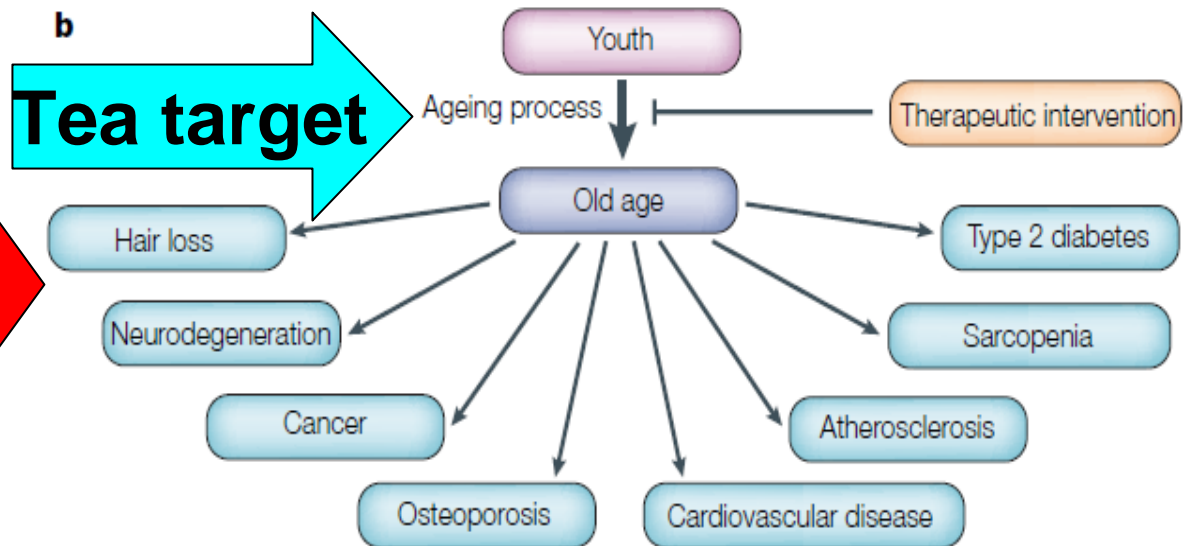
Aging: first risk factor of common geriatrics Oxidative stress; link aging and geriatrics



Present strategy: treatment geriatrics individually



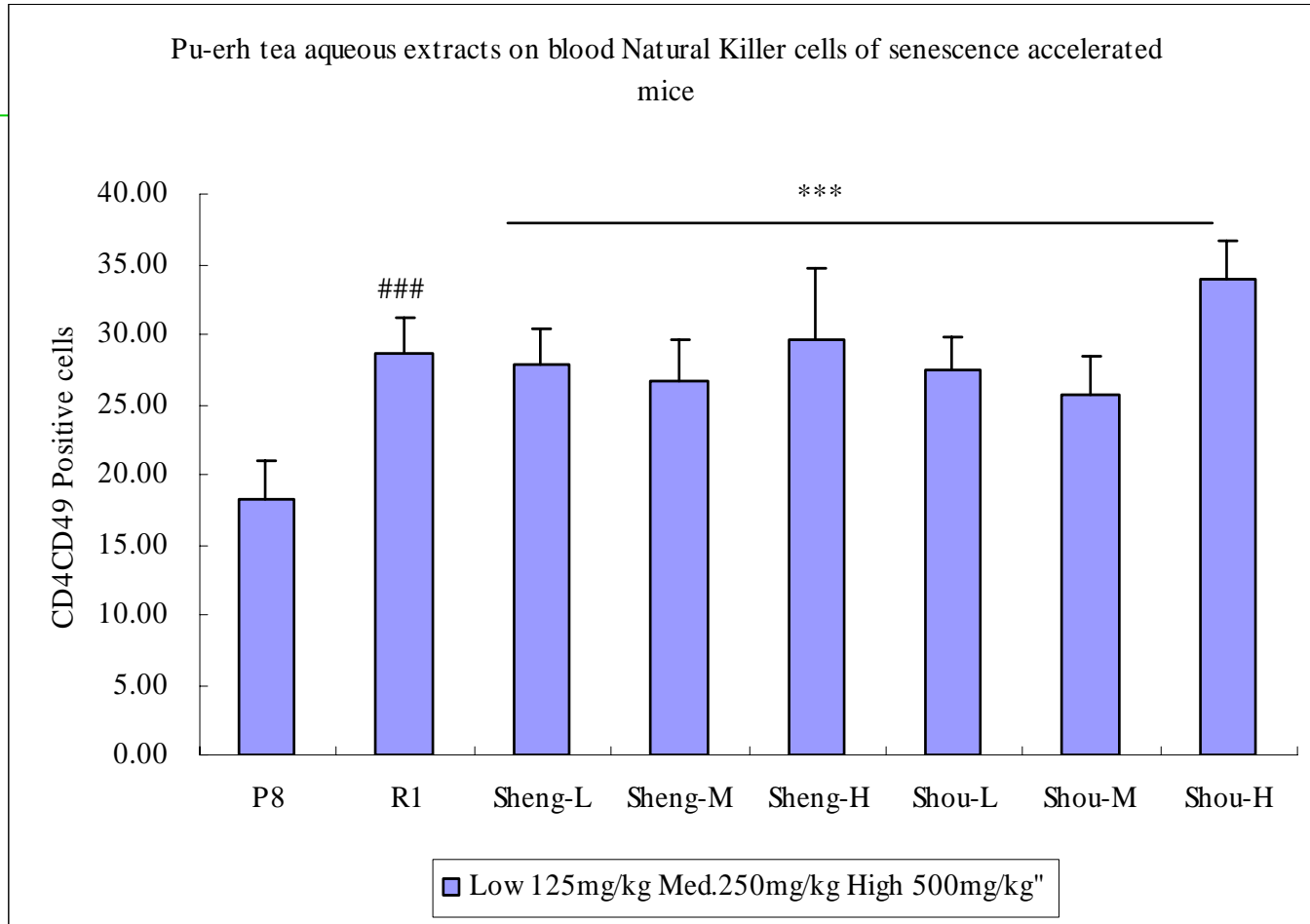
Treating aging to cure the diseases



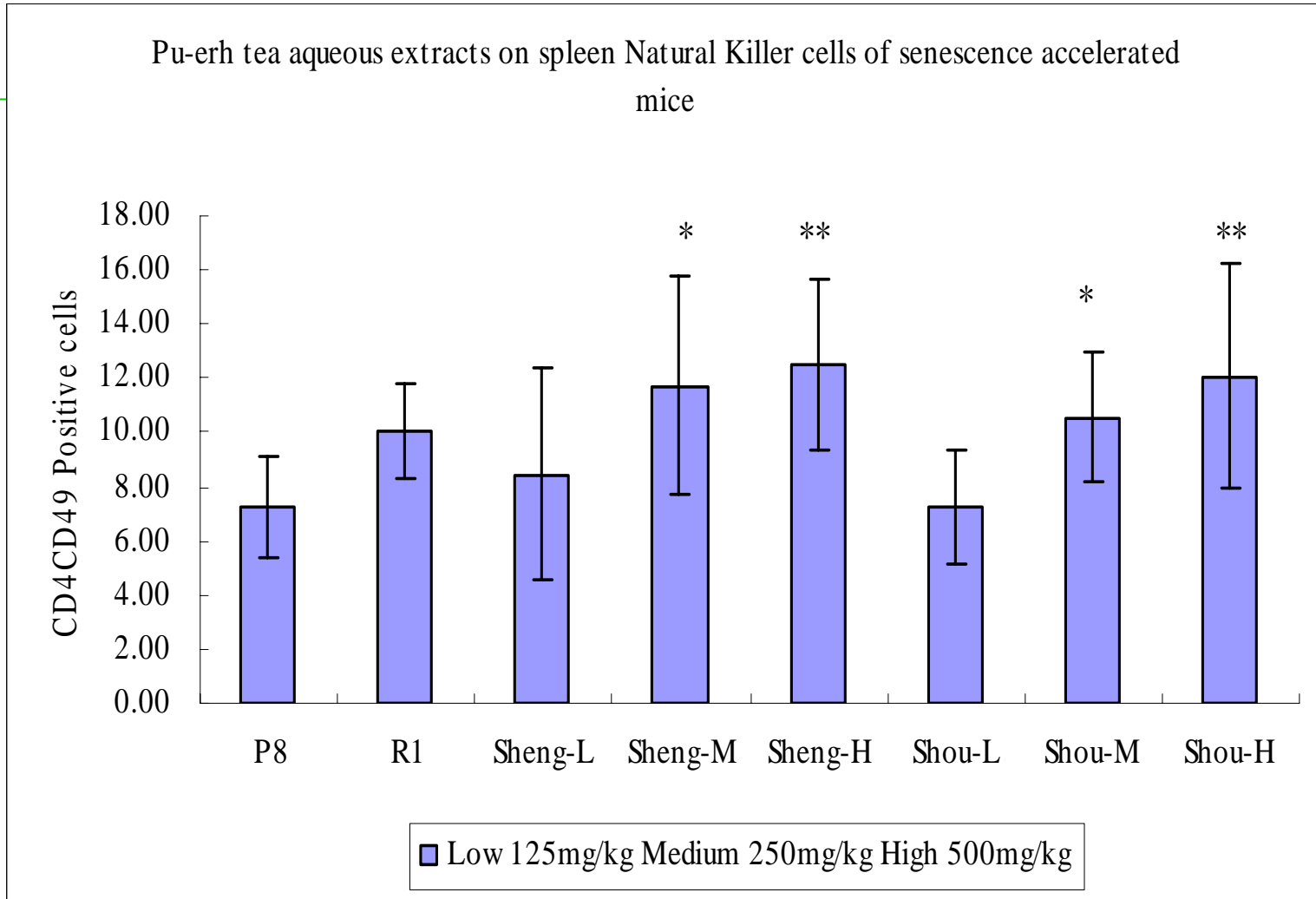
Immunosenescence

- Old people easily suffer from infection and tumor
- One of biggest trouble of human now
- No practical and effective approach

Natural Killer in blood

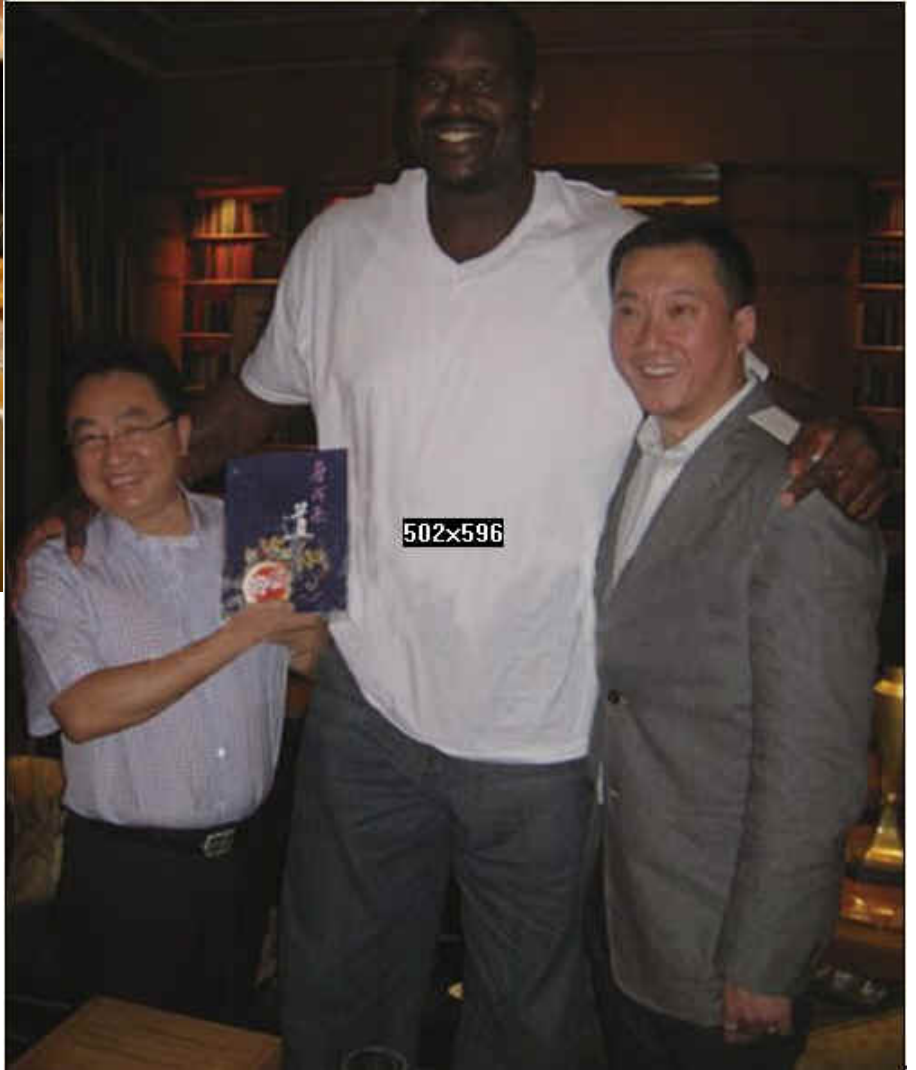


Natural Killer in spleen



Our results indicate:

- Pu-erh tea is not a cure for each elderly disease, it targets for basic mechanisms of all geriatrics.
- Pu-erh tea is not a cure for specific infections, but targets for underlying causes of all infections
- Daily drinking Pu-erh deals with big trouble



■ **Tea Drinking is beneficial to human health**

Hope you drink more tea





上善若水 精行俭德

“上善若水”出自于老子《道德经》第八章：“上善若水。水善利万物而不争，处众人之所恶，故几于道。居善地，心善渊，与善仁，言善信，正善治，事能，动善时。夫唯不争，故无尤。”老子还说：“以其不争，故天下莫能与之争，此乃效法水德也。水几于道；道无所不在，水无所不利，避高趋下，未尝有所逆善处地也；空处湛静，深不可测。善为渊也；损而不竭，施不求报，善为仁也。”此处取“上善若水”一词入院训，一取其哲理睿智，以作为我院师生为学为人的迪；二来“善水”喻普洱茶济世利人的本质，同时也是对所有茶品作为健康饮品的颂扬，以激励我院师生的专业自豪感，更好的继承和发扬茶文化，更好地研究和新普洱茶相关知识和技术。

“精行俭德”一词出自陆羽《茶经》。《茶经》中说：“茶者，南方之木也”，“茶性最宜精行俭德之”。这里的精行俭德，是指人的行为要精细、致、认真、勤奋、求实，品德要俭朴、高尚、纯正。陆羽在《茶经》中还强调，茶要适时采摘、精心制造，茶具要洁净，煮茶之水、煎茶之火都要有一定的规范。圣陆羽所倡导的饮茶之法，推而广之，就是做人处事，都应该讲求“精行俭德”。这种“精行俭德”精神，包含了健康、和乐、勤俭、精进和明智等中国茶文化的核心元素。

“上善若水，精行俭德”，前者是为学为人的哲学观，后者是茶道精神所要求的基本个人修养，我院师生当谨记在心、努力践行，并以此垂范世人。