

# Can You See A Taste?

Sondra Barrett, Ph.D

When I began photographing wine through a microscope four or five years ago, I was only looking for beautiful representatives of the 'inner' world of living things. However, my scientist's eye started seeing patterns and forms that repeated themselves with regularity in specific kinds of wines. I amusingly speculated that those luscious microscopic forms that I found in wine were the chemical triggers for taste and the biological basis for the language of taste.

My first meeting with winemaker Theo Rosenbrand encouraged me to continue looking at wines in this simple, unconventional way. When he responded to a photomicrograph of the 1978 Sterling Vineyards Merlot with, "That's what it tasted like!", an "Ah-ha!" flashed through my mind—perhaps photomicroscopy could see the taste of a wine. After all, I did see shapes that were sharp in demeanor and others that were rounded, supple, and smooth—weren't those terms also used to describe wines? We are all used to hearing one art form—winemaking—explained by another—poetry. Why not use yet another art form—photography—to help with the characterization of wine?

Ten years of research on the microscopic and chemical changes during maturation and growth of human blood cells had given me visual training and expertise to see microscopic patterns in wine. It seemed unlikely that these microscopic images could have anything to do with the ageing and maturation of wine.

Yet as I accumulated more microscopic wine signatures, the visual evidence began to convince me that these strange yet beautiful forms in wine needed further investigation for their potentially useful application. Following is a glimpse of the visual information I have uncovered, which may provide us with another way to appreciate and, perhaps, understand wine.

I applied differential interference microscopy to develop the basis of a new analytical method for assessing ageing, blending, and varietal quality in grapes and wine. Over the past five years, a dictionary of forms or 'wine alphabet' has evolved which helps me look into the essence of wine. Each form in this alphabet is given a number, since microscopic structure, like taste, evades accurate verbal descriptions. The constellation of shapes in a particular wine is its wine signature, which can be portrayed photographically or quantitatively.

Wine signatures change with age, different winemaking practices, and blending. Figure 1 compares the quantitative representation of the wine signatures of two different Cabernet

Sauvignons (Inglenook Limited Cask), showing the percentage of each of the forms present.

The hypothesis set up by this work is that this visual microscopic language could help us learn more about the structure of wine while objectifying our descriptions of the taste of wine. Most of us can taste the difference between a young and an old red wine. We can now also see visual differences besides color associated with ageing.

In the evolution of these new wine descriptors, several forms became indistinguishable with qualities of age: three were found predominantly in fermenting wines or wines younger than three years old; one, in wines older than 10 years. The forms in young wines are normally lost during ageing. Different ageing practices such as type and time of cooperage influence the quantity and nature of these forms. Young, angular wines give a wine signature of 'immature' sharp forms. Tartrate salts are the most likely candidates for the chemical identity of these early forms. The presence and possible evolution to other forms could provide inexpensively-obtained objective information for evaluating ageing practices.

The form frequently observed in old wines may be a visual indicator of decline. In only two instances out of hundreds of observations has this form been found in wines younger than 10

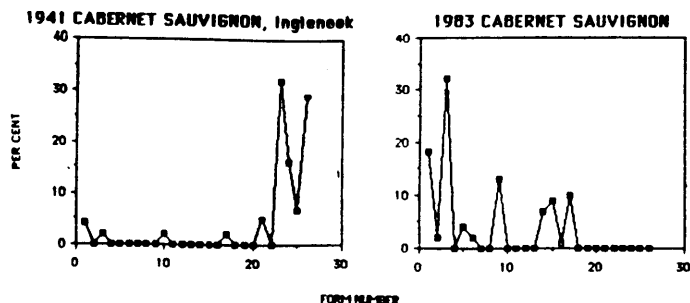


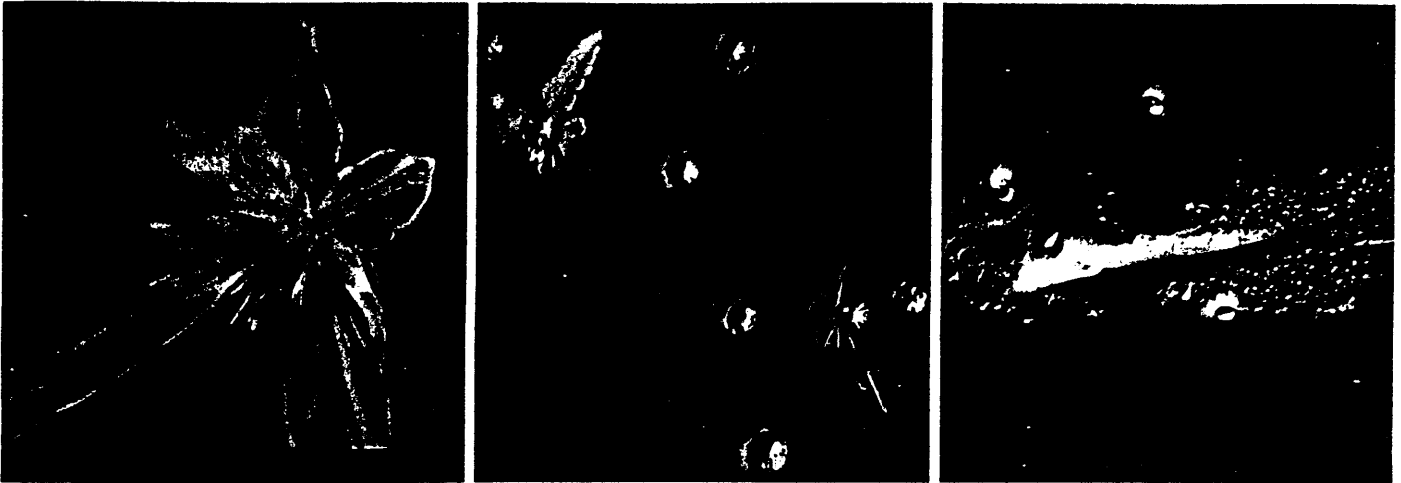
Figure 1. Graphic display of microscopic wine signatures of a young and an old Cabernet Sauvignon. Forms 23–26 are 'Cabernet-specific' forms; Form 10 is often found in old wines.

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Photomicrograph  
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Forms identified through photomicroscopy: (l) Chardonnay-specific form; (c) 'buttons' in 1968 Inglenook Cabernet Sauvignon; (r) 1959 Cabernet Sauvignon—this form is often found in older wines.

years. One was minimally contaminated with bacteria and the other just starting to 'go', according to taste. This visual clue could give us evidence, earlier than detectable organoleptic changes, that a wine is heading 'over the hill'.

Maturation of wines may be measurable microscopically. So, too, can varietal character be investigated. About half of all Chardonnays observed have a distinctive yet related wine signature. Cabernet Sauvignons with distinctive varietal character may also show pronounced visual traits. Observations of several hundred California Cabernets revealed four forms which developed over time in some of the wines. These particular forms appear to be useful in following the development and longevity of Cabernet. Looking at, and not tasting or smelling, 15 unidentified 1984 red wines from UC Davis showed that the two Cabernets were the only ones with Cabernet-specific forms.

Since I wanted to see if people could 'see while tasting' these forms, I decided to put this system to the test. Previously, at numerous tasting events with professionals and inexperienced tasters, I had found that some individuals can learn this visual language and even enjoyed 'getting into' wine in new ways.

At the Society of Wine Educators 1986 Annual Conference, I presented a workshop on photomicroscopy and ageing of Cabernet Sauvignon. The format was the initial presentation of the 'wine alphabet' with associated qualities of taste or age. Participants then had the opportunity to try their new talents

in visual perception of five unidentified Inglenook Cask Cabernets, 1974–1983. This group could taste and see the difference between young and old wines.

Seventy-four percent could identify organoleptically the youngest wine. When asked which wine tasted the 'sharpest' and would most likely have microscopic sharp forms, about half predicted the 1983 Cabernet, the wine which contained the most sharp forms. Eighty percent of the group could, by taste, identify the oldest Cabernet and, again, more than half the group predicted that this wine would have an old-age form of 'decline', which it did. Furthermore, another visual characteristic which seems to distinguish exceptional Cabernets, was tasted 'visually' by the group. This particular characteristic was perceived by taste to have a varietal-specific form not present in less distinctive wines.

The theoretical relationship between taste, quality, and microscopic form—form and function—is open to question. Yet as I talk to members of the wine community, I discover that there are supporters of this idea, people who see the potential of using wine signatures in practical ways such as making blending decisions. I suggest that we start to use these wine signatures as descriptors of taste adjunct to organoleptic terms.

The next time you taste a wine, close your eyes, and perhaps images will come to your mind—images of the taste. Can your taste see?